6800 Text Editor

technical systems consultants, inc.

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TEXT EDITING SYSTEM

INTRODUCTION

Contained in the following pages is a complete description and source listing of the TSC Text Editing System: This system is a content oriented text editor which is powerful, simple to use, and easy to learn. Particular attention should be paid to the section titled "Adapting to Your System".

As in all TSC software, a great effort has been put forth in testing to eliminate "bugs" in the code. This however is no guarantee of perfect code. If a suspected bug is spotted, please jot down the circumstances involved and send it to TSC. Errata sheets with all patches will be sent to owners if necessary.

GETTING THE SYSTEM STARTED

After all of the code has been entered, and all of the adaptations to your system have been made, start executing the program at location 200 hex. The system should respond with:

```
NEW FILE:
    1.00 =
```

The system is now ready to accept the text file input from the keyboard. If the editor is left and later it is desirable to reenter the editor to work on the previous text file, it is necessary to enter at location 203 hex, otherwise all workspace will be cleared. If a system containing MIKBUG® is used this "restart" address will automatically be used on a "G" command.

MINI-TUTORIAL

The purpose of this section is to briefly introduce the reader to the use of the TSC Text Editing System. We will, therefore, illustrate its use with a number of examples. In order to make it more obvious what things are typed by the user and what things are displayed by the editor, we will subscribe to the convention that things underlined are user-typed and things not underlined are displayed by the editor.

When the editor is initially entered, the response is as shown above. At this time we will create our file by simply typing all lines until finished, terminating each line with a "carriage return".

```
NEW FILE:
     1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
     2.00 =TSC TEXT EDITING SYSTEM. A NUMBER OF
     3.00 =EXAMPLES WILL BE SHOWN TO ALLOW EASY AND
     4.00 =QUICK LEARNING OF ITS FEATURES.
     5.00 =FOLLOWING ARE SOME NONSENSE LINES:
     6.00 =ABCDEFGHIJKL
     7.00 =AAAAAAAA
     8.00 =TESTING 1234
     9.00 =THIS EDITOR IS FUN TO USE!
    10.00 =BBBBBBBB
    11.00 =
    12.00 =THIS IS THE END OF THIS FILE,
    13.00 =AT LEAST FOR NOW.
    14.00 =#
    13.00 =AT LEAST FOR NOW.
#
```

Notice it was necessary to type a pound sign (#) in column one to leave the buffered input mode. At this time, the system printed the last line and returned with the system prompt (a pound sign). The editor is now ready to accept commands.

Any time characters are being typed into the editor the following two characters have special meaning:

1. "control" H - Deletes the last character typed (backspace).
2. "control" X - Deletes entire current line being typed.

These are useful, when detected typing errors occur, for immediate correction.

Each line of text in the edit file is given or has a line number which is used by the editor to uniquely identify the line. Each line number is

of the form "m.nn" where "m" is an integer and "n" represents any of the digits 0 through 9. To specify a line number, one has to specify only that portion of the line number to identify it uniquely. For example, 73, 73., 73.0, and 73.00 may be used to refer to line 73.00; 259.6 refers to line 259.60. The largest line number used with the editor is 9999.99. Let's denote a specification of a line of text by the symbol "<line>". We will be using this symbol throughout this document.

An editor command tells the editor what action is to be performed and usually what line or block of lines are to be affected (if any). For each editing facility supported by the editor, there is a directive which is used in commands to indicate the desired action. For example, the editor can delete lines of text from a file, insert lines of text into the file, print lines contained in the file, and so on. Corresponding to each capability there is a directive; hence, there is a Delete directive, an Insert directive, a Print directive, and so on. If we define the symbol <directive> to mean any editor directive, the basic from of an edit command is

<line><directive>

For example, the command to display (Print) line 12.00 is

```
#12 P
   12.00 =THIS IS THE END OF THIS FILE,
#
```

where "12" is the <line> specification and "P" is the <directive> in this command. As can be seen in the example, this causes line number 12 to be printed on the terminal.

Now let's learn how to use the Insert directive. In normal usage of the word "insert" we say something like, "Insert this card after this other card." To use the Insert directive, we specify the line after which we want to insert new lines followed by an I:

<line>I

After typing the directive followed by a carriage return, the editor will select an appropriate line number and prompt for input by displaying the line number followed by an equal sign. After each line of text is entered

and the carriage return is typed, the editor will prompt for the next line. To exit from the "Insert mode" one simply types a pound sign followed by an edit directive in response to a new line prompt.

Some examples of the use of Insert are

```
#8I
    8.10 =THIS IS AN INSERTED LINE.
    8.20 =SO IS THIS.
    8.30 =#11 I
   11.10 =ANOTHER INSERTED LINE.
   11.20 =#6 P
    6.00 =ABCDEFGHIJKL
```

It should be noted that the editor may renumber some lines following the inserted text. This occurs when enough lines are inserted such that the inserted line numbers overlap line numbers in the original text.

Next, let's learn how to use the Delete directive. With this directive we can delete one line or a block of lines with one directive. To delete only one line, we specify the <line> to be deleted followed by a D:

<line>D

When the carriage return is typed, the line disappears.

To delete more than one line we need to indicate not only the first line to delete but also the last line to be deleted. Let's call the last line the "target" line and denote its specification as "<target>". Although the editor supports fancier ways to specify the <target>, we'll just consider the two simplest: (1) <target> may be the number of lines to be deleted (counting both the first and last line of the block), or (2) <target> may be a pound sign followed immediately by the line number of the last line of the block to be deleted. Some example <target>s are: 3 (delete three lines), 26 (delete 26 lines), and #26 (delete lines through line 26.00).

The syntax to Delete a block of lines is

<line>D <target>

where <line> indicates the first line to delete and <target> indicates the scope of the delete.

To illustrate the use of the Delete directive, let's assume we have a file containing 53 lines with integer line numbers (i.e., 1, 2, 3, ..., 53).

With the directives

```
#15D
#24D #31
#52D 2
BOTTOM OF FILE REACHED
#
```

we now have a file with lines 1 through 14, 16 through 23, and 32 through 51. The first directive deleted line 15. The second directive deleted lines 24 through 31. The third directive deleted two lines starting with line 52. Since it deleted the last line of the file, the editor displayed the message "BOTTOM OF FILE REACHED."

Before we discuss any more directives, we need to expand the definitions of <line> and <target>.

As editing operations are performed, the editor keeps track of the "current line" which usually is the line most recently affected by a successful edit directive. Upon entering the editor, the "current line" is the first line of the file. If, for example, we have just inserted three lines between lines 12.00 and 13.00, the current line will be 12.30. One should note that after a line or a block of lines have been Deleted, the line immediately following the last one deleted is made the current line (if the last line of the file was deleted, the new last line of the file will be the current line).

In our discussions above, we have implied that one has to explicitly indicate a <line> for each directive by specifying the line number of the line of interest. However, if <line> is not specified in a directive, the "current line" is used. For example, if one enters the directive

```
#D 2
#
```

the editor will delete two lines starting with the current line. In our example, since we were at line 6.00, the "D2" operation deleted lines 6.00 and 7.00. As you will learn to appreciate, the "current line" default for line is extremely handy.

After performing all of the above operations, our file now looks like this:

```
 1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
 2.00 =TSC TEXT EDITING SYSTEM. A NUMBER OF
 3.00 =EXAMPLES WILL BE SHOWN TO ALLOW EASY AND
 4.00 =QUICK LEARNING OF ITS FEATURES.
 5.00 =FOLLOWING ARE SOME NONSENSE LINES:
 8.00 =TESTING 1234
 8.10 =THIS IS AN INSERTED LINE.
 8.20 =SO IS THIS.
 9.00 =THIS EDITOR IS FUN TO USE!
10.00 =BBBBBBBB
11.00 =
11.10 =ANOTHER INSERTED LINE.
12.00 =THIS IS THE END OF THIS FILE,
13.00 =AT LEAST FOR NOW.
```

We have seen that <line> may be specified by a line number or by default to the current line. There are also several other ways to specify <line>, or in other words, to move the pointer to a desired line prior to the execution of an edit directive. One may also specify <line> with a "+n" or "-n" (where n is an integer) meaning the next nth line in the file or the nth previous line in the file, respectively. Two other useful <line> designators are "↑" ("^" on some terminals) and "↓" (! on some terminals). The up arrow "↑" is used to designate the top or first line in the file. The down arrow "↓" is used to move to the last line or bottom of file. These various <line> specifiers are shown in the example below with the PRINT directive.

```
#^P
    1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
#+3 P
    4.00 =QUICK LEARNING OF ITS FEATURES.
#! P
   13.00 =AT LEAST FOR NOW.
#-2P
   11.10 =ANOTHER INSERTED LINE.
#
```

There may be times while editing a file when we know part of the contents of a line of interest but don't know its line number nor its displacement from the current line. In such a case we can use the "content-oriented" feature of the editor to find it. The syntax to specify <line>

in this way is

/<string>/

where "/" is a character to delimit (enclose) the <string> which is a sequence of characters known to be in the line. When <line> is specified as "/<string>/", the editor will search for the current line through the file to find the next line containing the specified <string>. Some examples will help to clarify this: (1) /PRINT/ denotes the next line containing the character string "PRINT", and (2) /GO TO 35/ refers to the next line containing "GO TO 35". If the <string> is found in any subsequent line of the file, that line will be made the current line and the requested edit operation will be performed on it. If the <string> does not occur anywhere subsequent in the file, the editor will issue the message "NO SUCH LINE" and will not change the current line pointer. Note that the delimiter does not need to be a slash; it may be some other character such as a quote (') or a comma. For example, 'A/B' refers to the next line containing "A/B".

It is also possible to prefix the string designator with "-" (minus sign) to indicate a previous line containing that string. A few examples with our TEST FILE will show the use of "/<string>/" as a <line> designator.

```
*-/QUICK/P
    4.00 =QUICK LEARNING OF ITS FEATURES.
*;123; P
    8.00 =TESTING 1234
*+'END'P
   12.00 =THIS IS THE END OF THIS FILE.
*
```

To summarize, we have seen that <line> may be specified a number of ways, namely: (1) by default to the current line, (2) by typing a line number, (3) by "+n" denoting the nth subsequent line, (4) by "-n" referring to the nth previous line, (5) by /<string>/ denoting the next line in the file containing the indicated string of characters, (6) "-/<string>/" to denote the nearest previous line containing the specified character string, (7) "↑" ("^" on some terminals) to denote the first line of the file, and (8) "↓" ("!" on some terminals) to denote the last line of the file.

Now lets turn our attention to expanding the definition of <target>. As you may recall, a <target> is used in some directives to indicate the

number of lines to be affected by the edit operation. We have already seen that a <target> may be specified by (1) an integer "n" indicating the number of lines to be affected, as P3, meaning print 3 lines, and (2) a line number preceded by a pound sign (#) indicating the line number of the last line to be affected, as P #6, meaning print all lines to and including line #6. The <target> is simply a designator telling how many lines the edit directive should operate on. In addition to the two mentioned forms of <target>, we also have, (3) if no <target> is specified in a command whose syntax includes one, a <target> of 1 is assumed, thereby affecting only one line. As with <line>, one may specify <target> by (4) "/<string>/" which indicates the next line in the file containing the specified character string, (5) "↑" to denote the top line in the file, and (6) "↓" to denote the bottom line in the file. A minus sign may be used to indicate that processing is to proceed backward through the file in the following two cases: (7) "-n" and (8) "-/<string>/".

With an understanding of <line> and <target> we can now discuss some more directives. The Print directive is used to display a line or a group of lines. Its syntax is

<line>P <target>

where "<line>" and "<target>" may be specified in any of the ways discussed above. To print just one line one needs to specify only <line> followed by a carriage return; therefore, the following two directives perform the same thing:

<line>P

and

<line>

Going back to our test file, we can illustrate the various forms of <target> as used with the Print directive.

```
*2P
    2.00 =TSC TEXT EDITING SYSTEM. A NUMBER OF
*-1
    1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
```

```
#P /EASY/
     1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
     2.00 =TSC TEXT EDITING SYSTEM. A NUMBER OF
     3.00 =EXAMPLES WILL BE SHOWN TO ALLOW EASY AND
#! P -3
    13.00 =AT LEAST FOR NOW.
    12.00 =THIS IS THE END OF THIS FILE,
    11.10 =ANOTHER INSERTED LINE.
#-/BBB/ P -/123/
    10.00 =BBBBBBBB
     9.00 =THIS EDITOR IS FUN TO USE!
     8.20 =SO IS THIS.
     8.10 =THIS IS AN INSERTED LINE.
     8.00 =TESTING 1234
#12P!
    12.00 =THIS IS THE END OF THIS FILE,
    13.00 =AT LEAST FOR NOW.
#
```

The first directive displayed line 2.00 and made that line the current line. The second directive requested that the line immediately preceding the current line be displayed. The third directive displayed the block of lines from the current line down through the line containing the character string "EASY". The fourth directive printed 3 lines starting at the bottom of the file and ending at line 11.10, which became the current line. The fifth directive requested the previous line containing the character string "BBB" be found, and then starting with that line, display all lines going backwards through the file until a line containing the character string "123" has been displayed. This shows the extreme usefulness and power of the content-oriented characteristic of the editor. The last directive requested that all lines from line 12.00 to the end or bottom of file be displayed.

The next directive to discuss is Next which is used primarily to move the current line pointer. Although it may be used otherwise, usually it is used only with the default <line>. Its syntax is

N <target>

This directive finds the line indicated by target , displays it, and makes it the current line. A few examples will illustrate its use.

```
#^P
    1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
#N
    2.00 =TSC TEXT EDITING SYSTEM. A NUMBER OF
#N 6
    8.20 =SO IS THIS.
#N -2
    8.00 =TESTING 1234
#
```

The following directive performs single-line replacements or inserts. Its syntax is

<line>=<text>

where "<line>" specifies the number of the line to be replaced or inserted and may, of course, default to the current line. "<text>" is the text to comprise the line. To illustrate this directive, let's continue our example series.

```
#=REPLACE CURRENT LINE HERE
#5.25=THIS LINE CREATED WITH "EQUALS".
#
```

The first directive changed the contents of line 8.00, the current line. The second example inserted a line with the line number 5.25. .

The next directive to be discussed is the Change directive. It is used to change occurrences of one character string into another. Its syntax is

<line>C /<string>$_1$/<string>$_2$/ <target> <occurrence>

where "/" is a delimiter character to separate the two character strings; "<string>$_1$" is the character string to be replaced; "<string>$_2$" is the string of characters to replace them; "<target>" specifies the range of the changes; and "<occurrence>" specifies which occurrence(s) of <string>$_1$ should be replaced in the line(s). If <occurrence> is 1 or is not specified, then only the first occurrence of <string>$_1$ in any line of the block will be changed--the second or subsequent occurrence of the string in such a line will not be affected. If 2 is specified for <occurrence>, then only the second occurrence of <string>$_1$ in any line of the block will be changed. To change all occurrences of the indicated string in the block, use an

asterisk (*) for <occurrence>. Let's illustrate the Change directive by continuing our example.

```
#4C /QUICK/FAST/
    4.00 =FAST LEARNING OF ITS FEATURES.
#8.1  C /THIS IS //
    8. 10=AN INSERTED LINE.
#-5C ;A;$; ;SOME; *
    3.00 =EX$MPLES WILL BE SHOWN TO $LLOW E$SY $ND
    4.00 =F$ST LE$RNING OF ITS FE$TURES.
    5.00 =FOLLOWING $RE SOME NONSENSE LINES:
#12 C /E/?/ -2 3
   12.00 =THIS IS THE END OF THIS FIL?,
   11.10 =ANOTHER INSERT?D LINE.
#
```

The first example replaced the string "QUICK" with the string "FAST" in line 4.00. The second example deleted the string "THIS IS" and a blank from line 8.10. The third example starts at the fifth previous line (line 3.00) and changes every occurrence of "A" to "$" down through all lines until the line containing the character string "SOME" (line 5.00) is reached. The last example changes the third occurrence of "E" to "?" in line 12.00 and then in line 11.10.

The last directive to be discussed is used to exit from the editor. This can be done several different ways: STOP, S, or LOG. This will return you to your system monitor.

Now lets go back to our test file and illustrate some of the features and directives we have discussed.

```
#^P!
    1.00 =THIS IS AN EXAMPLE OF THE FANTASTICALLY USEFUL
    2.00 =TSC TEXT EDITING SYSTEM. A NUMBER OF
    3.00 =EX$MPLES WILL BE SHOWN TO $LLOW E$SY $ND
    4.00 =F$ST LE$RNING OF ITS FE$TURES.
    5.00 =FOLLOWING $RE SOME NONSENSE LINES:
    5.25 =THIS LINE CREATED WITH "EQUALS".
    8.00 =REPLACE CURRENT LINE HERE
    8.10 =AN INSERTED LINE.
    8.20 =SO IS THIS.
```

```
     9.00 =THIS EDITOR IS FUN TO USE!
    10.00 =BBBBBBBB
    11.00 =
    11.10 =ANOTHER INSERT?D LINE.
    12.00 =THIS IS THE END OF THIS FIL?,
    13.00 =AT LEAST FOR NOW.
#2C/C /C 6800 /
     2.00 =TSC 6800 TEXT EDITING SYSTEM. A NUMBER OF
#/BBB/
    10.00 =BBBBBBBB
#-;THIS IS; C 'E'XX' !
     1.00 =THIS IS AN XXXAMPLE OF THE FANTASTICALLY USEFUL
     2.00 =TSC 6800 TXXXT EDITING SYSTEM. A NUMBER OF
     3.00 =XXX$MPLES WILL BE SHOWN TO $LLOW E$SY $ND
     4.00 =F$ST LXX$RNING OF ITS FE$TURES.
     5.00 =FOLLOWING $RXX SOME NONSENSE LINES:
     5.25 =THIS LINXX CREATED WITH "EQUALS".
     8.00 =RXXPLACE CURRENT LINE HERE
     8.10 =AN INSXXRTED LINE.
     9.00 =THIS XXDITOR IS FUN TO USE!
    11.10 =ANOTHXXR INSERT?D LINE.
    12.00 =THIS IS THXX END OF THIS FIL?,
    13.00 =AT LXXAST FOR NOW.
#N -4
    10.00 =BBBBBBBB
#-1 I
     9.10 =TEST-TEST-TEST
     9.20 =1234567890
     9.30 =#D!
BOTTOM OF FILE REACHED
#^D!
BOTTOM OF FILE REACHED
#^P!
#S
```

The previous tutorial has been only a brief introduction to the TSC Text Editing System. The remainder of this manual contains a detailed description of each directive with examples, in the next section, followed by "How to Use Tape" and "Adapting to Your System". It is important to read and study the entire manual in order to fully understand and utilize all of the power and features of this editor. The source listing is the last section.

EDITOR DIRECTIVES

There are five groups of editor directives: environment directives, system directives, "current line" movers, edit directives, and tape directives. A complete description of all directives in each group is given below. In the following descriptions, quantities enclosed in square brackets ([...]) are optional, and may be omitted. Verticle lines (|) separate options.

Several of the editor directives use character strings as arguments. These arguments are either matched against strings in the text, or replace a string in the text. A string argument begins after a delimiter character and continues as a sequence of any legal characters until the delimiter is again encountered. The delimiters are not considered part of the string to be used in the matching or replacement operations. Although the delimiters in the following descriptions are frequently represented as slashes, "/", any legal non-blank, non-alphanumeric character may be used as the delimiter such as: * / ( ) $ = , . ≡ [ ] : ' etc. Note that the following characters may not be used to enclose strings unless they are preceded by either a plus (+) or minus (-) sign: "↑" (denotes first line of file), "↓" (denotes last line of file), "-" (denotes target is above current line), and the character denoted by LINO (normally a pound sign) which is used to flag line numbers. The delimiter character is redefined in each new request by its appearance before a string. If two strings exist in one directive (as in the Change directive), the same delimiter character must be used for each string.

All of the editor directives use the <line> information preceeding the directive to position the pointer prior to any directive action. The <line> parameter may of course be null, meaning leave the pointer at its current position. All of the following are valid <line> designators:

1.	Any number	references a specific line number
2.	+n	denoting the nth subsequent line
3.	-n	denoting the nth previous line
4.	/<string>/	referring to the next line in the file containing the indicated string of characters

5.	-/<string>/	references a previous line containing the indicated string
6.	↑ (^ on some terminals)	denotes the first line of the file
7.	↓ (! on some terminals)	denotes the last line of the file
8.	null	stay at current line

Many of the editor directives require <target> information. This tells the editor to operate on the "current" line and all other lines in the file up to the line referenced by the <target>. In cases where a <target> is required, leaving it null will make the <target> default to 1, meaning only the current line will be affected by the directive. All of the following are valid <target> designators:

1.	an integer n	indicates that n lines should be affected by the edit operation
2.	#n	denotes the line number of the last line to be affected
3.	/<string>/	denotes the next line in the file containing the specified character string
4.	-/<string>/	references a previous line containing the indicated string
5.	↑	denotes all lines up to the top of the file
6.	↓	references all lines down to the bottom or last line of the file
7.	±n	indicates that n lines should be affected and in which direction from the current line
8.	(null)	defaults to 1 and only the current line is affected

As we have seen, the form <target> is used to specify a range of lines to which the directive will apply. The directive will be applied to each line, starting with the line specified by <line> and continuing until the target is reached.

If a string <target> is specified, the directive will apply to successive lines of text until a line containing the string is reached. Processing proceeds downward in the file unless the target is preceded by a "-" (minus sign), indicating that processing is to occur upward (toward

the first line) in the file. Targets may also be preceded by a plus sign (indicating downward movement). If a line number target is specified, processing begins at <line> and proceeds toward the target line number. Some examples of <target>s are

```
2
+10
-3
/STRING/
+/STRING TARGET/
-/BACKWARD DISPLACEMENT TO A STRING/
+*ANY DELIMITER WILL WORK FOR STRING*
++EVEN PLUS SIGNS WILL WORK+
#23.000
```

Any "/<string>/" descriptor may be postfixed with a column number immediately after the delimiter which indicates that the preceding string must begin in the column specified to be found. If the column specified is not in the range of the ZONE in effect, the request will be ignored. Some examples are

```
/IDENT/11
/PROGRAM/77
*LABEL*2
.COMMENT.30
```

Environment Directives

H[EADER] <columns>

MEANING:

A line of <columns> headings will be displayed. The heading is of the form "123456789012..." to indicate the column number. Columns for which tab stops are set will contain a minus character instead of the normal digit. If a column count is given, it becomes the default count such that if just "H" is typed afterwards, that number of columns will be printed.

EXAMPLES:

HEADER 72	Display column number headings for 72 columns.
H 30	Display column numbers for 30 columns.

NU[MBERS] [OFF|ON]

MEANING:

The line number flag is turned off or on. If the flag is off, then line numbers will never be printed. If neither "OFF" nor "ON" is specified, then the flag will be toggled from its current state.

EXAMPLES:

NUMBERS OFF	Turn line number printing off.
NU ON	Turn it back on.
NU	Toggle from "on" to "off" or from "off" to "on".

REN[UMBER]

MEANING:

The "renumber" directive will renumber all of the lines in the current edit file. Lines in the renumbered file will start with line number "1.00" and will have an increment of "1.00". The line which was "current" before the command will still be the current line after the command (although its number will probably have been changed).

EXAMPLES:

RENUMBER	Renumber the lines in the current working file.
REN	

SET <name> = '<char>'

MEANING:

SET is used to define certain special characters or symbols. The <name>s which may be set are:

TAB - the tab character,

FILL - the tab fill character,

EOL - the end of line character which may be used to separate several commands on a single line.

LINO - the line number flag character which is used to indicate that a target is a specific line number.

The default values are: TAB and EOL are "null".
FILL is "space"
LINO is "#"

EXAMPLES:

SET TAB = ':'	Set the tab character to semicolon.
SET TAB = ''	Disable tabbing by setting the tab character to null.
SET FILL = ' '	Set the tab fill character to a blank.
SET EOL = '$'	Set the EOL character to $.
SET LINO = '@'	Set the line number target escape

TAB [<columns>]

MEANING:

Used to set the tab stops. All previous tab stops are cleared. If no columns are specified then the only action is to clear all tab settings. Any TAB characters occurring beyond the last tab stop are left in the text. The maximum number of TAB stops allowed is 20.

EXAMPLES:

TAB 11, 18, 30	Set tab stops at columns 11, 18, and 30.
TAB 7 72	Set tab stops for a FORTRAN program.
TAB	Clear all tab stops.

V[ERIFY] [OFF|ON]

MEANING:

The verify flag is turned "on" or "off". The verify flag is used by the directives "CHANGE", and "NEXT" (and several others) to display their results. If neither "ON" nor "OFF" is specified, then the flag will be toggled from its current state.

EXAMPLES:

VERIFY OFF	Turn verification off.
V ON	Turn it back on.

X

MEANING:

"X" is the cursor control command. Any time this command is entered, the editor will issue the 6 special character string previously set up. See "Adapting to your System" for details.

EXAMPLES:

X	Output cursor control string.

Z[ONE] [C1, C2]

MEANING:

ZONE is used to restrict all sub-string searches (FIND, CHANGE, <target>s, etc.) to columns "C1" to "C2" inclusive. Any substrings beginning outside those columns will not be detected. If C1 and C2 are not specified, then the zones will be reset to their defaults (columns 1 and 136).

EXAMPLES:

ZONE 11, 29	Restrict searches to columns 11 through 29.
ZONE	Search columns 1 through 136.

System Directives

LOG

MEANING:

Exit the editor.

EXAMPLES:

LOG

S[TOP]

MEANING:

Same as "LOG".

EXAMPLES:

STOP

S

"Current Line" Movers

B[OTTOM]

MEANING:

Move to the last line in the file and make it the current line.

EXAMPLES:

BOTTOM	Make the last line of the file the current line.
B	

F[IND] <target> [<occurrence>]

MEANING:

Move the current line pointer to the line specified by <target> and make it the current line. If the VERIFY flag (see VERIFY) is on, the line will be printed. If <occurrence> is specified (an unsigned integer or an asterisk), the directive will be repeated <occurrence> times. An asterisk means all occurrences of the <target> will be found until the bottom or the top of the file is reached. If the target is not reached, the current line pointer will not be moved.

EXAMPLES:

FIND /STRING/	Find the next line containing the string "STRING".
F /A VERY LONG STRING/ F/THREE LINES/ 3	Find the next three lines containing the string "THREE LINES".
F/ALL TILL BOTTOM OF FILE/ *	Find all following occurrences of the indicated string.
F-/PROGRAM/7 *	Find all previous lines which contain the characters "PROGRAM" beginning in column seven.

N[EXT] [<target> [<occurrence>]]

MEANING:

The line specified by the target is made the current line. If the VERIFY flag is on, the line will be printed. If <occurrence> is specified, it must be an unsigned integer. It indicates which next occurrence of a line containing the target is to be made the current line. If the target is not reached, the current line pointer will be positioned at the bottom of the file (top of the file for a negative <target>). If no target is specified, the next line will be made the current line.

EXAMPLES:

NEXT 5	Make the fifth following line the current line.
N	Make the next line the current line.
N-10	Make the tenth previous line current.
N/STRING TARGET/	Make the next line containing "STRING TARGET" to be the current line.
N/THIRD OCCURRENCE/ 3	Make the third line containing the indicated string the current line.

T[OP]

MEANING:

The first line of the file becomes the current line

Edit Directives

A[PPEND] /<string>/ [<target>]

MEANING:

Append the specified <strings> just beyond the last character of the current line (and to successive until the target is reached). If the string is postfixed with a column number, then append the string beginning at the specified column (rather than at the end of the line). Any characters previously in the line following the specified column will be lost.

EXAMPLES:

APPEND /./	Append a period to the end of the current line.
A *HELLO* 2	Append the word "HELLO" to the end of the current line and to the end of the next line.
A/SEQUENCE/73 *END*7	Append the word "SEQUENCE" starting in column 73 of the current line and successive lines until a line containing the characters "END" beginning in column seven is found.

C[HANGE] /<string>$_1$/<string>$_2$/ [<target> [<occurrence>]]

MEANING:

Replace the string specified by <string>$_1$ with the string specified by <string>$_2$. If no <target> is specified, only the current line

is affected. The slashes represent any nonblank delimiter character. <occurrence> is used to specify which occurrence of <string>$_1$ is to be replaced in each line. It is either an unsigned integer or an asterisk, "*" signifying that all occurrences of the substring <string>$_1$ are to be replaced with <string>$_2$. By default, only the first occurrence will be changed. Note that if <occurrence> is specified, and if changes are to occur to the current line only, then the target should be a 1 (one).

EXAMPLES:

CHANGE /THIS/THAT/	Replace the first occurrence of "THIS" in the current line with "THAT".
C/A/B/ 1*	Change all occurrences of "A" in the current line to "B".
C /FIRST/LAST/10	Change the first occurrence of "FIRST" to "LAST" in the current line and also in the nine following lines.
C /NEW/OLD/ /A TARGET/	Change the first occurrence of "NEW" to "OLD" in each line down through the line containing the string "A TARGET".
C ,A,, -10 *	Remove all "A"s in the current line and in the nine preceding lines.
C*HELLO*	Delete the character string "HELLO" from the current line.

CO[PY] [<destination-target> [<range-target>]]

MEANING:

The current line and successive lines until the <range-target> is reached are copied so that they follow the line specified by destination-target . The default destination-target is 1, thereby causing a copy of the current line to be placed after the next line. The default <range-target> is 1, thereby copying only one line. After the directive is executed, the current line pointer will be positioned at the new position of the last line copied. Some lines may be renumbered after a copy.

EXAMPLES:

CO #18	Put a copy of the current line after line 18.
COPY #3 4	Copy four lines beginning with the current line and place them after line 3.
CO /HELLO DOLLY/ +/END OF RANGE/	After the next line which contains the string "HELLO DOLLY" place a copy of each line starting with the current line through the line containing "END OF RANGE".

D[ELETE] [<target>]

MEANING:

The current line (and successive lines until the target is reached) is deleted. After the directive is executed, the current line will be the line following the last line deleted.

EXAMPLES:

DELETE 5	Delete five lines (the current line and the next four lines).
D	Delete the current line.
D /STRING/	Delete lines from the current line through the next line that contains the string "STRING".

EXP[AND] [<target>]

MEANING:

The current tab character is expanded within all lines, beginning with the current line (and down to and including the line specified by target). Since tabs are normally expanded as lines are inserted into the file, this directive is primarily of use when one has forgotten to define a tab character.

EXAMPLES:

EXPAND 100	Expand 100 lines starting with the current line.
EXP	Expand the current line.

I[NSERT]

MEANING:

The editor will enter the buffered input mode, prompting with line numbers (unless line numbers have been disabled, see the "NUMBERS"

directive) and insert the lines below the current line. Buffered input continues until a line beginning with the breakpoint character (pound sign) in column one is received. The characters following the breakpoint character are treated as an editor directive. The editor will try to choose an insertion increment sufficient to insert at least 10 lines, or, if that is not possible, the smallest increment possible. The current line pointer is positioned at the last line inserted. It should be noted that the editor may renumber text lines following the inserted text if the inserted line numbers overlap line numbers previously in the file.

EXAMPLES:

INSERT	Accept line input after the current line.
I	

I[NSERT] <text>

MEANING:

The text (sequence of characters) which immediately follows the separator (or blank) after the directive name will be inserted as a separate line below the current line of the file. The line inserted becomes the current line. It should be noted that the editor may renumber text lines following the inserted text if the inserted line numbers overlap line numbers previously in the file.

EXAMPLES:

```
I THIS BELOW THE CURRENT LINE OF THE FILE
INSERT EVERYTHING AFTER THE FIRST BLANK
```

MO[VE] [<destination-target> [<range-target>]]

MEANING:

The current line (and successive lines until the <range-target> is reached) is moved so that it follows the line specified by <destination-target>. The default <destination-target> is 1, thereby moving the current line after the next line in the file.

The default <range-target> is 1, thereby moving only one line. After the directive is executed the current line pointer will be positioned at the new position of the last line moved. Some lines may be renumbered after a move.

EXAMPLES:

MOVE 3	Move the current line down three lines.
MO #1 /TARGET STRING/	Insert the current line and all lines down through the line containing "TARGET STRING" after line 1.
MO -/PROGRAM/ 5	Move five lines (including the current line) up within the file so that they follow a line containing the character "PROGRAM".
MO #10 -5	Move the current line and the four previous lines below line 10.

O[VERLAY] [<delimiter>]

MEANING:

The current line is printed, then a line of input is accepted from the terminal (the overlay line). The overlay line will be positioned directly beneath the line printed out. Each character of the overlay that is different from the <delimiter> character (default is a blank) will replace the corresponding character in the current line. The overlaid line will be printed if verify is "ON".

EXAMPLES:

```
OVERLAY
  25.00 = THIP IS THE CORRENT LUNE.
OVERLAY      S         U       I
  25.00 = THIS IS THE CURRENT LINE.
```

O[VERLAY] <d><text>

MEANING:

This directive is similar to the previous form of the OVERLAY directive with these differences: (1) The current line is not printed. (2) The remainder of the directive line is taken as the overlay text.

EXAMPLES:

```
OVERLAY---AT--------(-------)-----
 25.00 = THAT IS THE (CURRENT) LINE
```

P[RINT] [<target>]

MEANING:

Beginning with the current line, lines are printed until the line specified by target is reached. By default, only the current line will be printed.

EXAMPLES:

P	Print the current line.
PRINT 5	Print five lines starting with the current line.
P -10	Print the current line and the nine previous lines.
PRINT *STRING*	Print all lines down through the next line containing "STRING".
P -/STRING/	Print all lines up through the next previous line containing "STRING".

R[EPLACE] [<target>]

MEANING:

A "DELETE" from the current line through the <target> line is performed. The editor then enters the buffered input mode, putting the new lines into the area vacated. It is not necessary to enter the same number of lines as were deleted. The line numbers of the lines inserted will probably not be the same as those deleted. The current line pointer will be positioned at the last line inserted. Be default, only the current line will be deleted.

EXAMPLES:

R	Replace the current line.
REPLACE 10	Replace ten lines starting with the current line.
R /TARGET STRING/	Replace all lines from the current line through the line containing "TARGET STRING".

=<text>

MEANING:

The "=" directive replaces the current line with the text supplied. The replacement text begins with the first character following the equals sign. The current line pointer is not moved.

EXAMPLES:

= THIS IS THE REPLACEMENT TEXT.

(null)

MEANING:

The null directive (i.e., just a carriage return) prints the current line.

Tape Directives

GAP

MEANING:

Issue a string of 40 null characters to the tape unit.

EXAMPLES:

GAP	Puts leader or gap on tape.

READ

MEANING:

This directive will read the next file present on the loaded tape. All lines read will be appended to the end of the current work file and the last line read will become the "current" line.

EXAMPLE:

READ	Get the next file from the tape.

SAVE

MEANING:

Write the entire current file out to the tape unit. The file is written with no line numbers and is terminated with an ASCII "control Z" character.

EXAMPLE:

SAVE	Puts the current file on tape.

W[RITE] [<target>]

MEANING:

All lines from the current line through the target line are written out to tape. The same format as SAVE is used.

EXAMPLES:

WRITE	Write the current line to tape.
W #20	Write all lines from the current line through line #20 out to the tape unit.

USING TAPE

The TSC Text Editing System contains four tape directives. These can be used with most types of tape devices including paper tape and Kansas City Standard cassette systems such as the SWTPC AC-30 tape system. When using SAVE or WRITE the text is sent out to the tape in the following form:

TEXT...(carriage return)...TEXT...(C.R.)"control Z".

The "control Z" is the end of file marker. Note that there are no line numbers put on the tape, and also no line feeds or null characters, so the file is not suitable for displaying on a terminal in this form.

When a tape is read back into the editor using the READ command, line numbers are automatically put back in. The tape will be read until a "control Z" is found.

THe TSC Text Editing System provides delay after tape turn on for cassettes and also issues a control character for each "tape on" "tape off", "record on", and "record off". To set these characters to those needed by the tape system, see "Adapting to Your System".

The fourth tape directive is the GAP command. This is used to output 40 nulls to the tape. This can be used to put leader or trailer on the tape, or a gap between files.

ADAPTING TO YOUR SYSTEM

The TSC Text Editing System is assembled to run directly on a Motorola MIKBUG based 6800 system, such as the SWTPC 6800. It can, however, be converted with great ease to run on most other 6800 systems. The following information should be all that is necessary in most cases. Read through everything carefully before doing any conversion to be sure everything is understood. This section also contains information for MIKBUG machines to allow setting up the TAPE control characters and the cursor control characters for the X command. There is also information for setting memory end.

1. MEMORY END - The editor is assembled with memory end set at the end of an 8K system ($1FFF). To change this for your system put the end of memory address in locations $0212 and $0213. The memory end should not be set below address $17FF, the end of the first 6K block of memory.

2. INPUT CHARACTER ROUTINE - This routine is called by the editor and requires the following: The character input should be returned in the A accumulator, the B accumulator should remain unchanged, as well as the index (X) register. The editor is assembled referencing MIKBUG's input routine. To substitute the address of your input routine, enter it at location $0207 and $0208.

3. OUTPUT CHARACTER ROUTINE - This routine is called by the editor and performs the following: The character in the A accumulator is output to the terminal. The B accumulator and X registers remain unchanged. The editor is assembled referencing MIKBUG's output routine. To substitute the address of your output routine, enter it at location $020A and $020B. Both the input and output routines should be written as subroutines, meaning the last instruction should be RTS.

4. FULL DUPLEX - If your terminal requires software echo of typed characters and your input routine does not provide this, change the JMP (7E) at location $0206 to a JSR (BD).

5. INPUT CHARACTER FROM TAPE - If you use a tape system connected to a differnet I/O port than the terminals or use a different routine to handle tape operations, you can set the address of this routine at locations $020D and $020E. The character should be in A, while B and X should remain unchanged. The editor is assembled with MIKBUG's regular input routine.

6. OUTPUT CHARACTER TO TAPE - As explained above, if necessary to use a separate output routine for tape operations, set the address at locations $0210 and $0211. Character should be in A keeping B and X unchanged. The editor is assembled with the address of MIKBUG's regular output routine.

7. BACKSPACE CHARACTER - The backspace character ("control" H) is stored at location $049D. It is presently a 08. Change as desired.

8. DELETE CHARACTER - The delete character is stored in location $04AC. It is currently a $18 ("control" X). This may be changed as desired.

9. BELL CHARACTER - When the input buffer is overflowed (more than 136 characters typed) the editor outputs a "bell" character (07). This is stored at location $04C2 and may be changed as desired.

10. TAPE TURN ON DELAY - The editor is assembled to delay approximately 2 seconds after tape turn on before outputting data. This may be set as needed at location $00B6. It is currently 06. Setting it to 00 is zero delay, with larger values being longer delays.

11. TAPE CONTROL CHARACTERS - The editor outputs four special characters to control tape operations. These characters are presently set to nulls (00). To set these to your systems requirements, change the following locations.

    TAPE ON (PLAY) - $00B7
    TAPE OFF (PLAY) - $00B8
    TAPE ON (RECORD) - $00B9
    TAPE OFF (RECORD) - $00BA

12. CURSOR CONTROL CHARACTERS - The editor outputs a string of six characters upon execution of the "X" command. These can be set to special cursor

or other control characters. They are presently nulls (00). Set desired characters at location $0982 through $0987.

13. RETURN TO MONITOR ADDRESS - Upon execution of STOP, S, or LOG, the editor returns to the system monitor. The editor is assembled with the address of MIKBUG. Enter the address of your monitor at location $098C and $098D.

SYSTEM CHARACTERISTICS

1. The maximum line number is 9999.99. If more than 9,999 lines are entered, the line number counter will turn over (go back to 0), therefore, the editor should not be used with files of 10,000 lines or longer. (This is not really a limitation since 10,000 null lines (line number followed by a carriage return) uses up 40K of memory!)

2. The input buffer will hold 136 characters. If more than 136 characters are typed, they will be ignored and a "bell" character output to the terminal. To terminate the line it is necessary to type the backspace character and then a carriage return.

3. Setting the "tab" character and the "fill" character the same will defeat the TAB feature. There is no logical reason to do this.

4. Setting the "EOL" character will allow using multiple commands at a time. Insert and overlay cannot be followed by other commands. An example of EOL use (with EOL set to "$") is:

```
↑D2$P10$T
```

This sequence will delete the first 2 lines of the file, then print the next 10 lines, and finally, return the pointer to the top of the file.

MORE EXAMPLES

```
 NEW FILE:
     1.00 =** THIS IS A TEST PROGRAM **
     2.00 =
     3.00 =;ORG;$0100
     4.00 =START;LDX;#$FFF;SET COUNT
     5.00 =#3
     3.00 =;ORG;$0100
 #SET TAB=';'
 #TAB 9 16 26
 #SET EOL='$'
 #EXP !
 #T $ P 5
     1.00 =** THIS IS A TEST PROGRAM **
     2.00 =
     3.00 =          ORG     $0100
     4.00 =START     LDX     #$FFF       SET COUNT
 #I
     5.00 =;LDA A;#$40;SET SECOND COUNT
     6.00 =LOOP;DEC A;;DEC THE COUNT
     7.00 =;BNE;LOOP;LOOPTILL DONE
     8.00 =;DEX;;DEC THE X REG
     9.00 =;BNE;LOOP1;LOOP;TIL DONE
    10.00 =;LDA A;#'@;SET UP CHAR
    11.00 =;JSR;OUTCHR;OUTPUT IT
    12.00 =DONE;BRA;DONE;LOOP FOREVER
    13.00 =#T
 #NU
 #P!
 ** THIS IS A TEST PROGRAM **

          ORG     $0100
 START    LDX     #$FFF       SET COUNT
          LDA A   #$40        SET SECOND COUNT
 LOOP     DEC A               DEC THE COUNT
          BNE     LOOP        LOOPTILL DONE
          DEX                 DEC THE X REG
          BNE     LOOP1       LOOP;TIL DONE
          LDA A   #'@         SET UP CHAR
          JSR     OUTCHR      OUTPUT IT
 DONE     BRA     DONE        LOOP FOREVER
 #NU
 #
    12.00 =DONE     BRA     DONE        LOOP FOREVER
 #-,FFF, C ;FF ;FFF
     4.00 =START    LDX     #$FFFF      SET COUNT
 #H 45 $ P
            12345678-012345-789012345-78901234567890123456
     4.00 =START    LDX     #$FFFF      SET COUNT
```

```
#+1 0
    5.00 =          LDA A   #$40        SET SECOND COUNT
  OVERLAY LOOP1
    5.00 =LOOP1     LDA A   #$40        SET SECOND COUNT
#C;LOOP1;LOOP2; !
    5.00 =LOOP2     LDA A   #$40        SET SECOND COUNT
    9.00 =          BNE     LOOP2       LOOP;TIL DONE


#^ C ;LOOP ;LOOP1; !
    6.00 =LOOP1     DEC A               DEC THE COUNT
    7.00 =          BNE     LOOP1       LOOPTILL DONE
   12.00 =DONE      BRA     DONE        LOOP1FOREVER
#C;1;
   12.00 =DONE      BRA     DONE        LOOP FOREVER
#7C;PT;P T
    7.00 =          BNE     LOOP1       LOOP TILL DONE
#A, ! ,
    7.00 =          BNE     LOOP1       LOOP TILL DONE !
#B
#I ;END
#
   13.00 =          END
#R

   13.00 =
   14.00 =;END
   15.00 =
   16.00 =* THATS ALL *
   17.00 =#^P!
    1.00 =** THIS IS A TEST PROGRAM **
    2.00 =
    3.00 =          ORG     $0100
    4.00 =START     LDX     #$FFFF      SET COUNT
    5.00 =LOOP2     LDA A   #$40        SET SECOND COUNT
    6.00 =LOOP1     DEC A               DEC THE COUNT
    7.00 =          BNE     LOOP1       LOOP TILL DONE !
    8.00 =          DEX                 DEC THE X REG
    9.00 =          BNE     LOOP2       LOOP;TIL DONE
   10.00 =          LDA A   #"@         SET UP CHAR
   11.00 =          JSR     OUTCHR      OUTPUT IT
   12.00 =DONE      BRA     DONE        LOOP FOREVER
   13.00 =
   14.00 =          END
   15.00 =
   16.00 =* THATS ALL *
#LOG
*
```

```
LOCN B1 B2 B3
                *
                *   COPYRIGHT 1977 (C) BY
                *
                *   TECHNICAL SYSTEMS CONSULTANTS
                *   BOX 2570
                *   W. LAFAYETTE, INDIANA 47906
                *
                *

                * EXTERNAL EQUATES

      01FF      STACK   EQU     $01FF
      E0D0      MIKBUG  EQU     $E0D0
      0023      PROMPT  EQU     $23
      000D      CRGRET  EQU     $D
      0018      DELCOD  EQU     $18
      0008      BACKSP  EQU     $8
      0007      BELL    EQU     $7


                        ORG     $40

                * TEMPORARY STORAGE

0040            TEMP    RMB     2
0042            XSAVE   RMB     2
0044            BUFPNT  RMB     2
0046            BUFSAV  RMB     2
0048            CURPOS  RMB     2
004A            NEWPOS  RMB     2
004C            SRCHPT  RMB     2
004E            STRNGB  RMB     2
0050            STRNGE  RMB     2
0052            STRGB1  RMB     2
0054            STRGE1  RMB     2
0056            STRPNT  RMB     2
0058            SPCPT1  RMB     2
005A            SPCPT2  RMB     2
005C            LASTNO  RMB     2
005E            ZONE1   RMB     2
0060            ZONE2   RMB     2
0062            ZONBUF  RMB     2
0064            CHGPNT  RMB     2
0066            CHGEND  RMB     2
0068            OCRTMP  RMB     2
006A            NUMFLG  RMB     1
006B            VERFLG  RMB     1
006C            MSLFLG  RMB     1
006D            FSTZFL  RMB     1
006E            OCRCNT  RMB     2
0070            FNDFLG  RMB     1
0071            STRCN1  RMB     1
0072            OVRBEG  RMB     1
0073            OVREND  RMB     1
0074            NOCURL  RMB     1
```

```
LOCN B1 B2 B3
0075            LINFLG  RMB     1
0076            NXTFLG  RMB     1
0077            ALLFLG  RMB     1
0078            OCRFLG  RMB     1
0079            CHGONF  RMB     1
007A            APPCOL  RMB     1
007B            STRCNT  RMB     1
007C            INCAMT  RMB     1
007D            BMPFLG  RMB     1
007E            EQUFLG  RMB     1
007F            INLMFL  RMB     1
0080            MOVFLG  RMB     1
0081            REPFLG  RMB     1
0082            TMPCHR  RMB     1
0083            CHKFLG  RMB     1
0084            SNGLIN  RMB     1
0085            CHGFLG  RMB     1
0086            STRCN2  RMB     1
0087            FNONFL  RMB     1
0088            LSTFLG  RMB     1
0089            DECCNT  RMB     1
008A            PRNFLG  RMB     1
008B            CPYDRC  RMB     1
008C            DRCTN   RMB     1
008D            CHRCNT  RMB     2
008F            INZFLG  RMB     1
0090            NUMBER  RMB     3
0093            TRGLIN  RMB     2
0095            DELIM   RMB     1
0096            HEDCNT  RMB     1
0097            FILBEG  RMB     2
0099            FILEND  RMB     2
009B            TABPNT  RMB     2
009D            TABBUF  RMB     20
00B1 00         TABEND  FCB     0
00B2 00         TABCH   FCB     0
00B3 20         FILL    FCC     ' '

00B4 23         LINO    FCC     '#'

00B5 00         EOL     FCB     0
00B6 06         DELAY   FCB     6
00B7 00         TONCH   FCB     0
00B8 00         TOFCH   FCB     0
00B9 00         RONCH   FCB     0
00BA 00         ROFCH   FCB     0
00BB            BUFFER  RMB     136

                        ORG     $0200

                * PROGRAM STARTS HERE

0200 7E 03 55   START   JMP     INITLZ
```

```
LOCN B1 B2 B3  *
0203 7E 03 83  RESTRT  JMP    PEDIT

               * EXTERNAL I-O ROUTINES

0206 7E E1 AC  INCH    JMP    $E1AC
0209 7E E1 D1  OUTCH   JMP    $E1D1
020C 7E E1 AC  TINCH   JMP    $E1AC      TAPE INPUT ROUTINE
020F 7E E1 D1  TOUCH   JMP    $E1D1      TAPE OUTPUT ROUTINE
0212 1F FF     MEMEND  FDB    $1FFF


               * COMMAND TABLE

0214 41        TABLE   FCC    'APPEND'
0215 50
0216 50
0217 45
0218 4E
0219 44
021A 00                FCB    0
021B 12 DD             FDB    APPEND
021D 41                FCC    'A'

021E 00                FCB    0
021F 12 DD             FDB    APPEND
0221 42                FCC    'BOTTOM'
0222 4F
0223 54
0224 54
0225 4F
0226 4D
0227 00                FCB    0
0228 09 8E             FDB    BOTTOM
022A 42                FCC    'B'

022B 00                FCB    0
022C 09 8E             FDB    BOTTOM
022E 43                FCC    'CHANGE'
022F 48
0230 41
0231 4E
0232 47
0233 45
0234 00                FCB    0
0235 0D CB             FDB    CHANGE
0237 43                FCC    'COPY'
0238 4F
0239 50
023A 59
023B 00                FCB    0
023C 0F F3             FDB    COPY
023E 43                FCC    'CO'
023F 4F
0240 00                FCB    0
0241 0F F3             FDB    COPY
```

```
LOCN B1 B2 B3
0243 43                  FCC    'C'

0244 00                  FCB    0
0245 0D CB               FDB    CHANGE
0247 44                  FCC    'DELETE'
0248 45
0249 4C
024A 45
024B 54
024C 45
024D 00                  FCB    0
024E 0C 8A               FDB    DELETE
0250 44                  FCC    'D'

0251 00                  FCB    0
0252 0C 8A               FDB    DELETE
0254 45                  FCC    'EXPAND'
0255 58
0256 50
0257 41
0258 4E
0259 44
025A 00                  FCB    0
025B 12 5C               FDB    EXPAND
025D 45                  FCC    'EXP'
025E 58
025F 50
0260 00                  FCB    0
0261 12 5C               FDB    EXPAND
0263 46                  FCC    'FIND'
0264 49
0265 4E
0266 44
0267 00                  FCB    0
0268 09 CF               FDB    CFIND
026A 46                  FCC    'F'

026B 00                  FCB    0
026C 09 CF               FDB    CFIND
026E 47                  FCC    'GAP'
026F 41
0270 50
0271 00                  FCB    0
0272 14 13               FDB    GAP
0274 48                  FCC    'HEADER'
0275 45
0276 41
0277 44
0278 45
0279 52
027A 00                  FCB    0
027B 11 1B               FDB    HEADER
027D 48                  FCC    'H'

027E 00                  FCB    0
```

```
LOCN B1 B2 B3
027F 11 1B              FDB     HEADER
0281 49                 FCC     'INSERT'
0282 4E
0283 53
0284 45
0285 52
0286 54
0287 00                 FCB     0
0288 0A C8              FDB     INSERT
028A 49                 FCC     'I'

028B 00                 FCB     0
028C 0A C8              FDB     INSERT
028E 4C                 FCC     'LOG'
028F 4F
0290 47
0291 00                 FCB     0
0292 09 89              FDB     EXIT
0294 4D                 FCC     'MOVE'
0295 4F
0296 56
0297 45
0298 00                 FCB     0
0299 0F D4              FDB     MOVE
029B 4D                 FCC     'MO'
029C 4F
029D 00                 FCB     0
029E 0F D4              FDB     MOVE
02A0 4E                 FCC     'NEXT'
02A1 45
02A2 58
02A3 54
02A4 00                 FCB     0
02A5 09 CC              FDB     NEXT
02A7 4E                 FCC     'NUMBERS'
02A8 55
02A9 4D
02AA 42
02AB 45
02AC 52
02AD 53
02AE 00                 FCB     0
02AF 09 1D              FDB     NUMSET
02B1 4E                 FCC     'NU'
02B2 55
02B3 00                 FCB     0
02B4 09 1D              FDB     NUMSET
02B6 4E                 FCC     'N'

02B7 00                 FCB     0
02B8 09 CC              FDB     NEXT
02BA 4F                 FCC     'OVERLAY'
02BB 56
02BC 45
02BD 52
```

```
LOCN B1 B2 B3
02BE 4C
02BF 41
02C0 59
02C1 00                 FCB     0
02C2 0F 21              FDB     OVERLA
02C4 4F                 FCC     'O'

02C5 00                 FCB     0
02C6 0F 21              FDB     OVERLA
02C8 50                 FCC     'PRINT'
02C9 52
02CA 49
02CB 4E
02CC 54
02CD 00                 FCB     0
02CE 08 77              FDB     PRINT
02D0 50                 FCC     'P'

02D1 00                 FCB     0
02D2 08 77              FDB     PRINT
02D4 52                 FCC     'READ'
02D5 45
02D6 41
02D7 44
02D8 00                 FCB     0
02D9 14 2A              FDB     READ
02DB 52                 FCC     'RENUMBER'
02DC 45
02DD 4E
02DE 55
02DF 4D
02E0 42
02E1 45
02E2 52
02E3 00                 FCB     0
02E4 06 A5              FDB     RENUMB
02E6 52                 FCC     'REN'
02E7 45
02E8 4E
02E9 00                 FCB     0
02EA 06 A5              FDB     RENUMB
02EC 52                 FCC     'REPLACE'
02ED 45
02EE 50
02EF 4C
02F0 41
02F1 43
02F2 45
02F3 00                 FCB     0
02F4 0C 87              FDB     REPLAC
02F6 52                 FCC     'R'

02F7 00                 FCB     0
02F8 0C 87              FDB     REPLAC
02FA 53                 FCC     'SAVE'
```

```
LOCN B1 B2 B3
02FB 41
02FC 56
02FD 45
02FE 00                 FCB     0
02FF 13 9D              FDB     SAVE
0301 53                 FCC     'SET'
0302 45
0303 54
0304 00                 FCB     0
0305 11 CC              FDB     SET
0307 53                 FCC     'STOP'
0308 54
0309 4F
030A 50
030B 00                 FCB     0
030C 09 89              FDB     EXIT
030E 53                 FCC     'S'

030F 00                 FCB     0
0310 09 89              FDB     EXIT
0312 54                 FCC     'TAB'
0313 41
0314 42
0315 00                 FCB     0
0316 10 D0              FDB     TAB
0318 54                 FCC     'TOP'
0319 4F
031A 50
031B 00                 FCB     0
031C 09 9D              FDB     TOP
031E 54                 FCC     'T'

031F 00                 FCB     0
0320 09 9D              FDB     TOP
0322 56                 FCC     'VERIFY'
0323 45
0324 52
0325 49
0326 46
0327 59
0328 00                 FCB     0
0329 09 63              FDB     VERSET
032B 56                 FCC     'V'

032C 00                 FCB     0
032D 09 63              FDB     VERSET
032F 57                 FCC     'WRITE'
0330 52
0331 49
0332 54
0333 45
0334 00                 FCB     0
0335 13 AD              FDB     WRITE
0337 57                 FCC     'W'
```

```
LOCN B1 B2 B3
0338 00                  FCB    0
0339 13 AD               FDB    WRITE
033B 58                  FCC    'X'

033C 00                  FCB    0
033D 09 78               FDB    XCNTRL
033F 5A                  FCC    'ZONE'
0340 4F
0341 4E
0342 45
0343 00                  FCB    0
0344 11 7E               FDB    SZONE
0346 5A                  FCC    'Z'

0347 00                  FCB    0
0348 11 7E               FDB    SZONE
034A 00                  FCB    0


                * NEW FILE STRING

034B 4E          NWFSTR  FCC    'NEW FILE:'
034C 45
034D 57
034E 20
034F 46
0350 49
0351 4C
0352 45
0353 3A
0354 04                  FCB    4


                * INITIALIZATION ROUTINE

0355 8E 01 FF    INITLZ  LDS    #STACK
0358 CE 14 92            LDX    #BEGPNT
035B DF 97               STX    FILBEG
035D DF 99               STX    FILEND    SET END ALSO
035F CE 02 03            LDX    #RESTRT
0362 FF A0 48            STX    $A048     SET RESTART ADDRESS
0365 CE 00 01            LDX    #1        SET ZONES
0368 DF 5E               STX    ZONE1
036A CE 01 36            LDX    #$0136
036D DF 60               STX    ZONE2
036F 86 46               LDA A  #70       SET UP HEADER
0371 97 96               STA A  HEDCNT
0373 4F                  CLR A
0374 97 9D               STA A  TABBUF    FIX STORAGE
0376 4A                  DEC A
0377 97 8F               STA A  INZFLG
0379 97 6A               STA A  NUMFLG    TURN ON NUMBERS
037B 97 6B               STA A  VERFLG    ALSO VERIFICATION
037D CE 03 4B            LDX    #NWFSTR   POINT TO STRING
0380 BD 04 83            JSR    PSTRNG    OUTPUT IT
```

```
LOCN B1 B2 B3

                    * RESTART ENTRY POINT

0383 DE 97      PEDIT   LDX     FILBEG      POINT TO BEGIN
0385 DF 48              STX     CURPOS
0387 7F 00 6C           CLR     MSLFLG

                    * MAIN EDIT LOOP

038A 8E 01 FF   EDIT    LDS     #STACK      SETUP STACK POINTER
038D DF 40              STX     TEMP        SAVE POINTER
038F DE 48              LDX     CURPOS      SET CURRENT POSITION
0391 DF 4A              STX     NEWPOS      SAVE IT
0393 CE 00 6D           LDX     #PSTZFL
0396 4F                 CLR A               CLEAR ACC.
0397 A7 00      EDIT1   STA A   0,X          CLEAR OUT LOCATION
0399 08                 INX                 BUMP POINTER
039A 8C 00 8E           CPX     #CHRCNT+1
039D 26 F8              BNE     EDIT1
039F DE 40              LDX     TEMP        RESTORE POINTER
03A1 96 8F              LDA A   INZFLG      INITIALIZE?
03A3 27 06              BEQ     EDIT2
03A5 7F 00 8F           CLR     INZFLG
03A8 7E 0A EA           JMP     INSER4      GO INSERT LINES
03AB 96 6C      EDIT2   LDA A   MSLFLG      MULTIPLE ST. PER LINE?
03AD 26 22              BNE     EDIT55
03AF 97 8E              STA A   CHRCNT+1
03B1 CE 00 BB           LDX     #BUFFER     SET POINTER
03B4 BD 04 4E           JSR     PCRLF
03B7 86 23              LDA A   #PROMPT     SETUP PROMPT
03B9 BD 02 09           JSR     OUTCH       OUTPUT IT
03BC BD 04 99   EDIT3   JSR     INCHAR
03BF 27 C9              BEQ     EDIT
03C1 A7 00      EDIT4   STA A   0,X          PUT CHAR IN BUFFER
03C3 81 0D              CMP A   #CRGRET     IS IT A C.R.
03C5 27 05              BEQ     EDIT5
03C7 BD 04 BB           JSR     BUFLIM      IS BUFFER FULL?
03CA 20 F0              BRA     EDIT3       REPEAT
03CC CE 00 BB   EDIT5   LDX     #BUFFER     RESTORE POINTER
03CF DF 44              STX     BUFPNT
03D1 7F 00 6C   EDIT55  CLR     MSLFLG
03D4 BD 04 D2           JSR     FINDL       PROCESS LINE INFO
03D7 4F                 CLR A
03D8 97 75              STA A   LINFLG      CLEAR FLAS
03DA 97 8C              STA A   DRCTN
03DC DF 4A              STX     NEWPOS      SAVE POINTER
03DE DE 44              LDX     BUFPNT
03E0 BD 04 92           JSR     SKIPSP      SKIP SPACES
03E3 DF 44              STX     BUFPNT      SAVE POINTER
03E5 81 3D              CMP A   #'=         IS IT AN '='?
03E7 26 08              BNE     EDIT56
03E9 08                 INX                 BUMP POINTER
03EA DF 44              STX     BUFPNT
```

```
 LOCN B1 B2 B3
 03EC CE 0A A5            LDX     #EQUALS
 03EF 20 44               BRA     EDIT85     GO TO IT
 03F1 BD 06 63  EDIT56    JSR     TSTEND     TEST END
 03F4 26 05               BNE     EDIT58
 03F6 CE 08 77            LDX     #PRINT     POINT TO PRINT
 03F9 20 3A               BRA     EDIT85
 03FB DF 40     EDIT58    STX     TEMP
 03FD CE 02 14            LDX     #TABLE     POINT TO TABLE
 0400 DF 9B     EDIT6     STX     TABPNT     SAVE IT
 0402 6D 00               TST     0,X        IS IT NULL?
 0404 27 23               BEQ     EDIT8
 0406 A1 00               CMP A   0,X        CHECK CHARACTER
 0408 26 0C               BNE     EDIT7      ARE THEY EQUAL?
 040A DE 44               LDX     BUFPNT     RESTORE POINTER
 040C 08                  INX                BUMP IT
 040D A6 00     EDIT65    LDA A   0,X        GET NEXT CHAR.
 040F DF 44               STX     BUFPNT     SAVE POINTER
 0411 DE 9B               LDX     TABPNT
 0413 08                  INX                BUMP THE TABLE PNTR
 0414 20 EA               BRA     EDIT6
 0416 08        EDIT7     INX                BUMP THE POINTER
 0417 6D 00               TST     0,X        IS IT NULL?
 0419 26 FB               BNE     EDIT7
 041B 08                  INX                BUMP POINTER 3 TIMES
 041C 08                  INX
 041D 08                  INX
 041E 6D 00               TST     0,X        END OF TABLE?
 0420 27 1F               BEQ     ERROR      REPORT ERROR
 0422 09                  DEX
 0423 DF 9B               STX     TABPNT     SAVE THE POINTER
 0425 DE 40               LDX     TEMP
 0427 20 E4               BRA     EDIT65     REPEAT
 0429 08        EDIT8     INX                BUMP THE POINTER
 042A EE 00               LDX     0,X        GET ADDRESS
 042C 8C 0A C8            CPX     #INSERT    IS IT INSERT?
 042F 26 04               BNE     EDIT85
 0431 96 7F               LDA A   INLMFL
 0433 26 0A               BNE     EDIT88
 0435 BD 08 21  EDIT85    JSR     TSTOVR     LIMITS?
 0438 26 25               BNE     NOTFND
 043A 4F                  CLR A              CLEAR FLAGS
 043B 97 72               STA A   OVRBEG
 043D 97 73               STA A   OVREND
 043F 6E 00     EDIT88    JMP     0,X        GO TO IT


                * ERROR ROUTINE

0441 CE 04 4C  ERROR     LDX     #ERRSTR    POINT TO STRING

                * PRINT ERROR MESSAGE

0444 8D 3D     PRERROR   BSR     PSTRNG
0446 7F 00 6C            CLR     MSLFLG     CLEAR FLAG
0449 7E 03 8A            JMP     EDIT       RETURN
```

```
LOCN B1 B2 B3

044C 3F          ERRSTR  FCC     '?'

044D 04                  FCB     4

                 * PRINT CARRIAGE RETURN & LINE FEED

044E DF 42       PCRLF   STX     XSAVE       SAVE POINTER
0450 CE 04 58            LDX     #CRLFST     POINT TO STRING
0453 8D 30               BSR     PDATA1
0455 DE 42               LDX     XSAVE       RESTORE STRING
0457 39                  RTS                 RETURN

0458 0D          CRLFST  FCB     $D,$A,0,0,0,0,4
0459 0A
045A 00
045B 00
045C 00
045D 00
045E 04

                 * REPORT LINE NOT FOUND

045F CE 04 64    NOTFND  LDX     #NOFSTR     POINT TO STRING
0462 20 E0               BRA     PREROR

0464 4E          NOFSTR  FCC     'NO SUCH LINE'
0465 4F
0466 20
0467 53
0468 55
0469 43
046A 48
046B 20
046C 4C
046D 49
046E 4E
046F 45
0470 04                  FCB     4

                 * REPORT SYNTAX ERROR

0471 CE 04 76    SYNERR  LDX     #SYNSTR     POINT TO STRING
0474 20 CE               BRA     PREROR

0476 53          SYNSTR  FCC     'SYNTAX ERROR'
0477 59
0478 4E
0479 54
047A 41
047B 58
047C 20
```

```
LOCN B1 B2 B3
047D 45
047E 52
047F 52
0480 4F
0481 52
0482 04                 FCB     4

                * PRINT STRING ROUTINE

0483 8D C9      PSTRNG  BSR     PCRLF       OUT C.R. L.F.
0485 A6 00      PDATA1  LDA A   0,X         GET CHAR.
0487 81 04              CMP A   #4          IS IT TERM?
0489 27 0D              BEQ     SKIPS2
048B BD 02 09           JSR     OUTCH       OUTPUT IT
048E 08                 INX                 BUMP POINTER
048F 20 F4              BRA     PDATA1

                * SKIP ALL SPACES

0491 08         SKIPSA  INX
0492 A6 00      SKIPSP  LDA A   0,X         GET A CHAR.
0494 81 20              CMP A   #'          IS IT A SPACE?
0496 27 F9              BEQ     SKIPSA      REPEAT
0498 39         SKIPS2  RTS                 RETURN

                * INPUT AND CHECK CHARACTER

0499 BD 02 06   INCHAR  JSR     INCH        GET CHAR
049C 81 08      INCHR1  CMP A   #BACKSP     IS IT A BACKSPACE?
049E 26 0B              BNE     INCHR3
04A0 8C 00 BB           CPX     #BUFFER     BUFFER BEGINNING?
04A3 27 15              BEQ     INCHR4
04A5 09                 DEX                 DEC THE POINTER
04A6 7A 00 8E           DEC     CHRCNT+1
04A9 20 EE              BRA     INCHAR
04AB 81 18      INCHR3  CMP A   #DELCOD     IS IT A DELETE?
04AD 27 0B              BEQ     INCHR4
04AF 81 1F              CMP A   #$1F        IS IT CONTROL?
04B1 22 04              BHI     INCH35
04B3 81 0D              CMP A   #CRGRET     IS IT A C.R.?
04B5 26 E2              BNE     INCHAR
04B7 7C 00 8E   INCH35  INC     CHRCNT+1      INC CHAR. COUNT
04BA 39         INCHR4  RTS                 RETURN

                * CHECK FOR BUFFER OVERFLOW

04BB 08         BUFLIM  INX                 BUMP THE POINTER
04BC 8C 01 43           CPX     #BUFFER+136
04BF 26 F9              BNE     INCHR4
04C1 86 07      OVER    LDA A   #BELL       LOAD UP BELL
04C3 BD 02 09           JSR     OUTCH       OUTPUT IT
```

```
LOCN B1 B2 B3
04C6 BD 02 06          JSR     INCH        GET NEW CHAR.
04C9 81 08             CMP A   #BACKSP     IS IT BACKSPACE?
04CB 26 F4             BNE     OVER
04CD 09                DEX                 DEC THE POINTER
04CE 7A 00 8E          DEC     CHRCNT+1
04D1 39                RTS                 RETURN

                * PROCESS LINE ROUTINE

04D2 8D BE     FINDL   BSR     SKIPSP      SKIP SPACES
04D4 81 3D             CMP A   #'=         IS IT '='?
04D6 27 0A             BEQ     FINDL0
04D8 7C 00 75          INC     LINFLG      SET FLAG
04DB BD 07 3B          JSR     CLASS       CLASSIFY CHAR.
04DE C1 01             CMP B   #1          IS IT A LETTER
04E0 23 03             BLS     FINDL2
04E2 DE 4A     FINDL0  LDX     NEWPOS      SET POINTER
04E4 39        FINDL1  RTS                 RETURN
04E5 27 23     FINDL2  BEQ     FIND1
04E7 20 14             BRA     FIND

                * TARGET ENTRY POINT

04E9 8D 03     FINDT   BSR     FINDT0
04EB DF 93             STX     TRGLIN      SAVE TARGET POS.
04ED 39                RTS                 RETURN
04EE 7F 00 8C  FINDT0  CLR     DRCTN
04F1 BD 07 38          JSR     SKPCLS
04F4 C1 01             CMP B   #1          IS IT A LETTER?
04F6 23 03             BLS     FINDT2
04F8 7E 04 71  FINDT1  JMP     SYNERR      REPORT SYNTAX ERROR
04FB 27 7D     FINDT2  BEQ     FIND62
04FD 7F 00 8C  FIND    CLR     DRCTN       CLEAR DIRECTION
0500 91 B4             CMP A   LINO        IS IT LINE NUMBER
0502 26 2E             BNE     FIND2
0504 08                INX                 BUMP THE POINTER
0505 BD 04 92          JSR     SKIPSP
0508 DF 44             STX     BUFPNT
050A BD 07 55  FIND1   JSR     BCDCON
050D DF 40             STX     TEMP        SAVE POINTER
050F DE 4A             LDX     NEWPOS
0511 96 90             LDA A   NUMBER      GET NUMBER
0513 A1 00             CMP A   0,X         COMPARE IT
0515 26 0A             BNE     FIND14
0517 96 91             LDA A   NUMBER+1    GET NEXT NUM.
0519 A1 01             CMP A   1,X         COMPARE
051B 26 04             BNE     FIND14
051D 96 92             LDA A   NUMBER+2
051F A1 02             CMP A   2,X
0521 24 03     FIND14  BCC     FIND16
0523 7A 00 8C          DEC     DRCTN       SET DIRECTION
0526 DE 40     FIND16  LDX     TEMP        RESTORE POINTER
0528 BD 07 AB          JSR     FNDNUM      FIND LINE NUMBER
052B 27 B7             BEQ     FINDL1
```

```
LOCN B1 B2 B3
052D D7 74          STA B  NOCURL
052F 7E 07 F0       JMP    BAKONE
0532 BD 06 63 FIND2 JSR    TSTEND
0535 26 0A          BNE    FIND3
0537 7D 00 76       TST    NXTFLG    CHECK FLAG
053A 27 A6          BEQ    FINDLO
053C DE 4A          LDX    NEWPOS    SET POINTER
053E 7E 08 0F       JMP    UPONE     UP ONE LINE
0541 81 21    FIND3 CMP A  #'!       IS IT A '!'?
0543 26 08          BNE    FIND4
0545 08             INX               BUMP THE POINTER
0546 DF 44          STX    BUFPNT
0548 DE 99          LDX    FILEND    SET POINTER
054A 7E 07 F0       JMP    BAKONE    BACKUP ONE LINE
054D 81 5E    FIND4 CMP A  #'^       IS IT A '^'?
054F 26 09          BNE    FIND5
0551 7A 00 8C       DEC    DRCTN     SET DIRECTION
0554 08             INX               BUMP THE POINTER
0555 DF 44          STX    BUFPNT
0557 DE 97          LDX    FILBEG    SET POINTER TO BEGIN
0559 39             RTS               RETURN
055A 81 2B    FIND5 CMP A  #'+       IS IT A '+'?
055C 27 07          BEQ    FIND6
055E 81 2D          CMP A  #'-       IS IT A '-'?
0560 26 47          BNE    FIND7
0562 7A 00 8C       DEC    DRCTN     DEC DIRECTION
0565 08       FIND6 INX               BUMP THE POINTER
0566 BD 07 38       JSR    SKPCLS    SKIP SPACES
0569 C1 01          CMP B  #1        IS IT NUMBER?
056B 27 0D          BEQ    FIND62
056D 23 3A          BLS    FIND7
056F D6 75          LDA B  LINFLG    TEST FLAG
0571 27 85          BEQ    FINDT1
0573 BD 07 A3       JSR    CLRNUM
0576 DE 4A          LDX    NEWPOS    SET POINTER
0578 20 1A          BRA    FIND66
057A BD 07 55 FIND62 JSR   BCDCON    CONVERT NUMBER
057D DE 4A          LDX    NEWPOS    SET POINTER
057F 7D 00 75       TST    LINFLG    CHECK FLAG
0582 26 08          BNE    FIND65
0584 BD 08 38 FIND63 JSR   TSTNUM    IS IT ZERO?
0587 27 1F          BEQ    FIND67
0589 BD 08 2A       JSR    DECNUM    DEC NUMBER
058C BD 08 38 FIND65 JSR   TSTNUM    TEST NUMBER
058F 27 17          BEQ    FIND67
0591 BD 08 2A       JSR    DECNUM
0594 BD 06 C3 FIND66 JSR   NXTLIN    GOTO NEXT LINE
0597 BD 08 21       JSR    TSTOVR    CHECK LIMITS
059A 27 F0          BEQ    FIND65
059C 96 73          LDA A  OVREND    BEGINNING?
059E 26 08          BNE    FIND67
05A0 BD 08 38       JSR    TSTNUM
05A3 26 03          BNE    FIND67
05A5 7C 00 7F       INC    INLMFL
05A8 39       FIND67 RTS             RETURN
```

```
LOCN B1 B2 B3
05A9 8D 4F      FIND7   BSR     SETDEL      SET DELIMITER
05AB 8D 6D      FIN702  BSR     ZONE        SET ZONE
05AD DE 4A              LDX     NEWPOS      SET POINTER
05AF BD 06 C3           JSR     NXTLIN      GO TO NEXT
05B2 08         FIND71  INX                 BUMP POINTER 3 TIMES
05B3 08                 INX
05B4 08                 INX
05B5 BD 06 5A   FIN711  JSR     FIXZON      CHECK FOR POSTZONE
05B8 BD 08 2A   FIND72  JSR     DECNUM      DEC COLUMN COUNT
05BB 27 22              BEQ     FIND75
05BD C6 0D              LDA B   #CRGRET
05BF E1 00              CMP B   0,X         TEST FOR C.R.
05C1 27 03              BEQ     FIND73
05C3 08                 INX                 BUMP THE POINTER
05C4 20 F2              BRA     FIND72      REPEAT
05C6 96 85      FIND73  LDA A   CHGFLG      CHECK IF CHANGE
05C8 26 DE              BNE     FIND67
05CA 08                 INX                 BUMP THE POINTER
05CB 9C 99              CPX     FILEND      END OF FILE ?
05CD 27 06              BEQ     *+08
05CF 09                 DEX
05D0 96 85      FIND74  LDA A   CHGFLG
05D2 26 D4              BNE     FIND67
05D4 09                 DEX                 DEC THE POINTER
05D5 BD 06 C3           JSR     NXTLIN
05D8 BD 08 21           JSR     TSTOVR      CHECK LIMITS
05DB 26 17              BNE     FIND77
05DD 20 D3              BRA     FIND71
05DF BD 06 5A   FIND75  JSR     FIXZON      FIX UP ZONE
05E2 BD 06 CD           JSR     STRING      PROCESS STRING
05E5 7D 00 70           TST     FNDFLG      FIND IT?
05E8 27 E6              BEQ     FIND74
05EA 5F                 CLR B
05EB 96 85              LDA A   CHGFLG
05ED 26 05              BNE     FIND77
05EF BD 07 F6           JSR     BAKON2
05F2 DF 93              STX     TRGLIN      SAVE TARGET POINTER
05F4 39         FIND77  RTS                 RETURN
05F5 86 01      FIND78  LDA A   #1          SET FLAG
05F7 97 73              STA A   OVREND
05F9 39                 RTS                 RETURN


                * SET UP DELIMITERS

05FA 97 95      SETDEL  STA A   DELIM       SAVE DELIMITER
05FC 5F                 CLR B
05FD 08                 INX                 BUMP THE POINTER
05FE DF 4E              STX     STRNGB      SAVE BEGINNING
0600 A6 00      SETDE2  LDA A   0,X         GET A CHARACTER
0602 8D 5F              BSR     TSTEND
0604 27 08              BEQ     SETDE4
0606 91 95              CMP A   DELIM       IS IT A DELIMITER?
0608 27 04              BEQ     SETDE4
060A 08                 INX                 BUMP THE POINTER
```

```
LOCN B1 B2 B3
060B 5C                INC B                BUMB COUNTER
060C 20 F2             BRA     SETDE2       REPEAT
060E DF 50      SETDE4 STX     STRNGE       SAVE END OF STRING
0610 D7 7B             STA B   STRCNT
0612 8D 4F             BSR     TSTEND
0614 27 01             BEQ     SETDE5
0616 08                INX                  BUMP THE POINTER
0617 DF 44      SETDE5 STX     BUFPNT
0619 39                RTS                  RETURN


                * SET UP ZONE

061A BD 07 3B  ZONE    JSR     CLASS        GO CLASSIFY CHAR.
061D 7F 00 6D          CLR     PSTZFL       CLEAR FLAG
0620 C1 01             CMP B   #1           IS IT A NUMBER
0622 26 17             BNE     ZONE3
0624 BD 07 55          JSR     BCDCON       CONVERT NUMBER
0627 8D 1B             BSR     CMPZN1       CHECK ZONE1
0629 25 10             BCS     ZONE3
062B 8D 22             BSR     CMPZN2       CHECK ZONE2
062D 22 0C             BHI     ZONE3
062F 7C 00 6D          INC     PSTZFL       SET FLAG
0632 96 90             LDA A   NUMBER       PUT NUM IN ZONE BUF.
0634 97 62             STA A   ZONBUF
0636 96 91             LDA A   NUMBER+1
0638 97 63             STA A   ZONBUF+1
063A 39                RTS                  RETURN
063B 96 5E     ZONE3   LDA A   ZONE1        PUT ZONE1 IN BUF.
063D 97 62             STA A   ZONBUF
063F 96 5F             LDA A   ZONE1+1
0641 97 63             STA A   ZONBUF+1
0643 39                RTS                  RETURN


                * COMPARE ZONE1 TO NUMBER

0644 D6 90     CMPZN1  LDA B   NUMBER       GET NUMBER
0646 D1 5E             CMP B   ZONE1        CHECK
0648 26 04             BNE     CMPZ14
064A D6 91             LDA B   NUMBER+1
064C D1 5F             CMP B   ZONE1+1
064E 39        CMPZ14  RTS                  RETURN


                * COMPARE ZONE2 TO NUMBER

064F D6 90     CMPZN2  LDA B   NUMBER       GET NUMBER
0651 D1 60             CMP B   ZONE2        CHECK
0653 26 04             BNE     CMPZ24
0655 D6 91             LDA B   NUMBER+1
0657 D1 61             CMP B   ZONE2+1
0659 39        CMPZ24  RTS                  RETURN
```

```
LOCN B1 B2 B3
                    * PUT CORRECT ZONE IN NUMBER

065A 96 62      FIXZON  LDA A  ZONBUF     GET ZONE
065C 97 90              STA A  NUMBER     PUT IN NUMBER
065E 96 63              LDA A  ZONBUF+1
0660 97 91              STA A  NUMBER+1
0662 39                 RTS                RETURN

                    * TEST TERMINATOR (C.R. OR EOL)

0663 81 0D      TSTEND  CMP A  #CRGRET    IS IT C.R.?
0665 27 02              BEQ    TSTEN2
0667 91 B5              CMP A  EOL
0669 39         TSTEN2  RTS                RETURN

                    * BUMP NUMBER BY 1, .1, OR .01

066A 86 01      BMPNUM  LDA A  #1
066C D6 7C              LDA B  INCAMT     CHECK AMOUNT
066E 27 0C              BEQ    INCNUM
0670 2A 02              BPL    BMPNU4
0672 86 10              LDA A  #$10       SET BUMP
0674 9B 92      BMPNU4  ADD A  NUMBER+2   ADD IN
0676 19                 DAA               ADJUST IT
0677 97 92              STA A  NUMBER+2   SAVE
0679 25 01              BCS    INCNUM
067B 39                 RTS                RETURN

                    * INCREMENT NUMBER BY ONE

067C 86 01      INCNUM  LDA A  #1         SET UP ONE
067E 5F                 CLR B
067F 9B 91              ADD A  NUMBER+1   ADD IN ONE
0681 19                 DAA               ADJUST IT
0682 97 91              STA A  NUMBER+1   SAVE IT
0684 17                 TBA
0685 99 90              ADC A  NUMBER
0687 19                 DAA               ADJUST NUMBER
0688 97 90              STA A  NUMBER
068A 39                 RTS                RETURN

                    * PUT NUMBER AT X

068B 96 90      PUTNUM  LDA A  NUMBER     GET NUMBER
068D A7 00              STA A  0,X        SAVE IT
068F 96 91              LDA A  NUMBER+1
0691 A7 01              STA A  1,X
0693 96 92              LDA A  NUMBER+2
0695 A7 02              STA A  2,X
0697 39                 RTS                RETURN
```

```
LOCN B1 B2 B3

                    * GET NUMBER FROM X

0698 A6 00      GETNUM  LDA A   0,X         GET NUMBER
069A 97 90              STA A   NUMBER      SAVE IT
069C A6 01              LDA A   1,X
069E 97 91              STA A   NUMBER+1
06A0 A6 02              LDA A   2,X
06A2 97 92              STA A   NUMBER+2
06A4 39                 RTS                 RETURN


                    * RENUMBER FILE

06A5 BD 09 A4   RENUMB  JSR     TFORCR
06A8 DE 97              LDX     FILBEG      SET POINTER
06AA 7F 00 7C   RENUM1  CLR     INCAMT
06AD BD 07 A3           JSR     CLRNUM      CLEAR NUMBER
06B0 8D B8      RENUM2  BSR     BMPNUM      BUMP NUMBER
06B2 8D D7              BSR     PUTNUM      SAVE IT
06B4 BD 08 0F           JSR     UPONE
06B7 96 73              LDA A   OVREND      HIT LIMIT?
06B9 27 F5              BEQ     RENUM2      REPEAT
06BB 96 83              LDA A   CHKFLG      CHECK FLAG
06BD 27 01              BEQ     RENUM4
06BF 39                 RTS                 RETURN
06C0 7E 08 A2   RENUM4  JMP     PRINT6      RETURN


                    * GO TO NEXT LINE

06C3 96 8C      NXTLIN  LDA A   DRCTN        CHECK DIRECTION
06C5 2B 03              BMI     NXTLI2
06C7 7E 08 0F           JMP     UPONE        MOVE UP ONE
06CA 7E 07 F0   NXTLI2  JMP     BAKONE       MOVE BACK ONE


                    * PROCESS STRING ROUTINE

06CD 7F 00 70   STRING  CLR     FNDFLG      CLEAR FLAG
06D0 D6 7B              LDA B   STRCNT
06D2 26 06              BNE     STRIN1
06D4 7C 00 70           INC     FNDFLG      FOUND NULL STRING
06D7 DF 5C              STX     LASTNO      SAVE POINTER
06D9 39                 RTS                 RETURN
06DA C6 0D      STRIN1  LDA B   #CRGRET
06DC DF 4C              STX     SRCHPT      SAVE POINTER
06DE DF 5C              STX     LASTNO      SAVE POINTER
06E0 DE 4E              LDX     STRNGB      POINT TO BEGIN
06E2 DF 56      STRIN2  STX     STRPNT      SAVE POINTER
06E4 A6 00              LDA A   0,X         GET A CHARACTER
06E6 DE 4C              LDX     SRCHPT      RESTORE POINTER
06E8 E1 00      STRIN3  CMP B   0,X          C. RET. ?
06EA 27 1D              BEQ     STRIN4
06EC A1 00              CMP A   0,X         COMP. CHAR.
```

```
LOCN B1 B2 B3
06EE 27 1D              BEQ     STRIN5
06F0 7D 00 6D           TST     PSTZFL      POST ZONE?
06F3 26 14              BNE     STRIN4
06F5 7D 00 70           TST     FNDFLG      FOUND?
06F8 26 22              BNE     STRIN6
06FA 08                 INX                 BUMP THE POINTER
06FB DF 5C              STX     LASTNO      SAVE IT
06FD 36                 PSH A               SAVE ACC.
06FE 37                 PSH B
06FF BD 06 7C           JSR     INCNUM      INC NUMBER
0702 BD 06 4F           JSR     CMPZN2      CHECK ZONE2
0705 33                 PUL B               RESTORE ACC
0706 32                 PUL A
0707 23 DF              BLS     STRIN3
0709 7F 00 70 STRIN4    CLR     FNDFLG      CLEAR FLAG
070C 39                 RTS                 RETURN
070D 08               STRIN5    INX
070E DF 4C              STX     SRCHPT      SAVE IT
0710 7C 00 70           INC     FNDFLG      SET FLAG
0713 DE 56              LDX     STRPNT      POINT TO STRING
0715 08                 INX                 BUMP THE POINTER
0716 9C 50              CPX     STRNGE      END OF STRING?
0718 27 0F              BEQ     STRIN7
071A 20 C6              BRA     STRIN2
071C DE 5C    STRIN6    LDX     LASTNO      RESTORE POINTER
071E 08                 INX
071F BD 06 7C           JSR     INCNUM      BUMP NUMBER
0722 BD 06 4F           JSR     CMPZN2      CHECK ZONE
0725 23 A6              BLS     STRING
0727 20 E0              BRA     STRIN4
0729 D6 7B    STRIN7    LDA B   STRCNT      GET COUNT
072B 27 08    STRIN8    BEQ     STRIN9
072D 37                 PSH B               SAVE
072E BD 06 7C           JSR     INCNUM      FIX COL
0731 33                 PUL B
0732 5A                 DEC B               DEC COUNT
0733 26 F6              BNE     STRIN8
0735 DE 5C    STRIN9    LDX     LASTNO
0737 39                 RTS                 RETURN

                * SKIP AND CLASSIFY

0738 BD 04 92 SKPCLS    JSR     SKIPSP

                * CLASSIFY CHARACTER

073B DF 44    CLASS     STX     BUFPNT      SAVE POINTER
073D A6 00              LDA A   0,X         GET CHARACTER
073F 5F                 CLR B
0740 81 2F              CMP A   #$2F        CHECK IF NUMBER
0742 23 10              BLS     CLASS4
0744 81 39              CMP A   #'9
0746 22 02              BHI     CLASS2
```

```
LOCN B1 B2 B3
0748 5C             INC B           SHOW NUMBER
0749 39             RTS             RETURN
074A 81 40    CLASS2 CMP A  #$40    CHECK IF LETTER
074C 23 06           BLS    CLASS4
074E 81 5A           CMP A  #'Z
0750 22 02           BHI    CLASS4
0752 C6 02           LDA B  #2      SHOW LETTER
0754 39       CLASS4 RTS            RETURN

                * CONVERT ASCII TO BCD

0755 8D 4C    BCDCON BSR    CLRNUM  CLEAR NUMBER
0757 8D E2    BCDC01 BSR    CLASS   CLASSIFY CHAR.
0759 C1 01           CMP B  #1      IS IT A NUMBER?
075B 27 07           BEQ    BCDC02
075D 81 2E           CMP A  #'.     IS IT A '.'?
075F 27 17           BEQ    BCDC05
0761 DF 44    BCDC15 STX    BUFPNT  SAVE POINTER
0763 39              RTS             RETURN
0764 08       BCDC02 INX             BUMP THE POINTER
0765 84 0F           AND A  #$0F     MASK ASCII
0767 C6 04           LDA B  #4       SET COUNTER
0769 78 00 91 BCDC04 ASL    NUMBER+1
076C 79 00 90        ROL    NUMBER  SHIFT EVERYTHING LEFT
076F 5A              DEC B          DEC THE COUNTER
0770 26 F7           BNE    BCDC04
0772 9B 91           ADD A  NUMBER+1 ADD IN NUMBER
0774 97 91           STA A  NUMBER+1
0776 20 DF           BRA    BCDC01
0778 C6 02    BCDC05 LDA B  #2       SET COUNTER
077A D7 89           STA B  DECCNT
077C 08       BCDC06 INX             BUMP THE POINTER
077D 8D BC           BSR    CLASS   CLASSIFY CHAR.
077F C1 01           CMP B  #1      IS IT NUMBER?
0781 27 04           BEQ    BCDC65
0783 4F              CLR A
0784 09              DEX             DEC THE POINTER
0785 20 02           BRA    BCDC67
0787 84 0F    BCDC65 AND A  #$0F     MASK ASCII
0789 C6 04    BCDC67 LDA B  #4       SET COUNTER
078B 78 00 92 BCDC07 ASL    NUMBER+2
078E 5A              DEC B
078F 26 FA           BNE    BCDC07
0791 9B 92           ADD A  NUMBER+2
0793 97 92           STA A  NUMBER+2
0795 7A 00 89        DEC    DECCNT  DEC COUNTER
0798 26 E2           BNE    BCDC06
079A 08       BCDC08 INX             BUMP THE POINTER
079B 8D 9E           BSR    CLASS   CLASSIFY CHAR.
079D C1 01           CMP B  #1      IS IT NUMBER?
079F 27 F9           BEQ    BCDC08
07A1 20 BE           BRA    BCDC15
```

```
LOCN B1 B2 B3
                    * CLEAR NUMBER ROUTINE

07A3 4F             CLRNUM  CLR A               CLEAR ACC.
07A4 97 90                  STA A   NUMBER
07A6 97 91                  STA A   NUMBER+1    CLEAR ALL OUT
07A8 97 92                  STA A   NUMBER+2
07AA 39                     RTS                 RETURN


                    * FIND NUMBERED LINE

07AB D6 90          FNDNUM  LDA B   NUMBER      GET DIGIT
07AD 96 91                  LDA A   NUMBER+1
07AF DE 97                  LDX     FILBEG      SET POINTER TO BEGIN
07B1 9C 99          FNDNU1  CPX     FILEND      END OF FILE?
07B3 26 05                  BNE     FNDNU4
07B5 7C 00 73               INC     OVREND      SET ERROR FLAG
07B8 5C             FNDNU2  INC B
07B9 39                     RTS                 RETURN
07BA E1 00          FNDNU4  CMP B   0,X         COMPARE DIGIT
07BC 22 1C                  BHI     FNDNU5
07BE 26 F8                  BNE     FNDNU2
07C0 A1 01                  CMP A   1,X         COMP NEXT DIGIT
07C2 22 16                  BHI     FNDNU5
07C4 26 F2                  BNE     FNDNU2
07C6 D6 92                  LDA B   NUMBER+2    NEXT DIGIT
07C8 E1 02                  CMP B   2,X         CHECK DIGIT
07CA 22 0E                  BHI     FNDNU5
07CC 26 EA                  BNE     FNDNU2
07CE 7D 00 84               TST     SNGLIN
07D1 26 05                  BNE     FNDN45
07D3 7D 00 83               TST     CHKFLG
07D6 26 E0                  BNE     FNDNU2
07D8 5F             FNDN45  CLR B
07D9 39                     RTS                 RETURN
07DA 7D 00 83       FNDNU5  TST     CHKFLG
07DD 26 F9                  BNE     FNDN45
07DF 8D 05                  BSR     FNDCRT      FIND C.R.
07E1 D6 90                  LDA B   NUMBER      RESTORE NUM
07E3 08                     INX                 BUMP THE POINTER
07E4 20 CB                  BRA     FNDNU1      REPEAT


                    * FIND THE NEXT CARRIAGE RETURN

07E6 36             FNDCRT  PSH A               SAVE ACC.
07E7 86 0D                  LDA A   #CRGRET
07E9 08             FNDCR2  INX                 BUMP THE POINTER
07EA A1 00                  CMP A   0,X         CHECK FOR C.R.
07EC 26 FB                  BNE     FNDCR2
07EE 32                     PUL A               RESTORE ACC.
07EF 39                     RTS                 RETURN


                    * MOVE BACK ONE LINE
```

```
LOCN B1 B2 B3

07F0 9C 97      BAKONE  CPX     FILBEG
07F2 27 17              BEQ     BAKON6
07F4 C6 01              LDA B   #1          SET COUNTER
07F6 09         BAKON2  DEX                 DEC THE POINTER
07F7 9C 97              CPX     FILBEG      BEGINNING?
07F9 27 0D              BEQ     BAKON5
07FB A6 00              LDA A   0,X         GET A CHAR.
07FD 81 0D              CMP A   #CRGRET     IS IT C.R.?
07FF 26 F5              BNE     BAKON2
0801 5A                 DEC B               DEC THE COUNTER
0802 2A F2              BPL     BAKON2
0804 08                 INX                 BUMP THE POINTER
0805 C6 01              LDA B   #1
0807 39         BAKON4  RTS                 RETURN
0808 5D         BAKON5  TST B
0809 27 FC              BEQ     BAKON4
080B 7C 00 72   BAKON6  INC     OVRBEG      SET ERROR FLAG
080E 39                 RTS                 RETURN


                * MOVE UP ONE LINE

080F 9C 99      UPONE   CPX     FILEND      END OF FILE?
0811 26 06              BNE     UPONE2
0813 C6 01      UPONE1  LDA B   #1          SET ERROR FLAG
0815 D7 73              STA B   OVREND
0817 20 D7              BRA     BAKONE
0819 8D CB      UPONE2  BSR     FNDCRT      FIND NEXT C.R.
081B 08                 INX                 BUMP THE POINTER
081C 9C 99              CPX     FILEND      END?
081E 27 F3              BEQ     UPONE1
0820 39                 RTS                 RETURN


                * TEST FOR OVER END LIMITS

0821 7D 00 72   TSTOVR  TST     OVRBEG      BEGINNING?
0824 26 03              BNE     TSTOV2
0826 7D 00 73           TST     OVREND      END?
0829 39         TSTOV2  RTS                 RETURN


                * DECREMENT NUMBER BY ONE

082A 86 99      DECNUM  LDA A   #$99
082C 16                 TAB                 SET UP $9999
082D 9B 91              ADD A   NUMBER+1    ADD IN
082F 19                 DAA                 ADJUST IT
0830 97 91              STA A   NUMBER+1    SAVE
0832 17                 TBA
0833 99 90              ADC A   NUMBER
0835 19                 DAA
0836 97 90              STA A   NUMBER
```

```
LOCN B1 B2 B3

                    * TEST NUMBER FOR ZERO

0838 96 90          TSTNUM  LDA A   NUMBER      CHECK IF ZERO
083A 26 02                  BNE     TSTNU2
083C 96 91                  LDA A   NUMBER+1
083E 39             TSTNU2  RTS                 RETURN

                    * VERIFY LINE ROUTINE

083F DF 4A          VERLIN  STX     NEWPOS      SAVE POINTER
0841 BD 07 E6               JSR     FNDCRT
0844 DF 5A                  STX     SPCPT2      SAVE POSITION
0846 4F                     CLR A
0847 97 8D                  STA A   CHRCNT
0849 09             VERLI1  DEX                 DEC POINTER
084A 09                     DEX
084B 09                     DEX
084C 09             VERL12  DEX                 DEC THE POINTER
084D E6 00                  LDA B   0,X         CHECK CHAR
084F C1 0D                  CMP B   #CRGRET     IS IT C.R.?
0851 27 09                  BEQ     VERL15
0853 E6 03                  LDA B   3,X         CHECK
0855 C1 20                  CMP B   #' '        IS IT A SPACE?
0857 26 03                  BNE     VERL15
0859 4C                     INC A
085A 20 F0                  BRA     VERL12
085C 97 8E          VERL15  STA A   CHRCNT+1    SAVE COUNT
085E 08                     INX
085F 08                     INX
0860 08                     INX                 BUMP POINTER
0861 08                     INX
0862 DF 58                  STX     SPCPT1
0864 BD 0D 43               JSR     DELCHR      DELETE SPACES
0867 DE 4A                  LDX     NEWPOS
0869 96 6B                  LDA A   VERFLG      CHECK FLAG
086B 27 05                  BEQ     VERLI2
086D 8D 40                  BSR     OUTLIN      OUTPUT LINE
086F BD 07 F0               JSR     BAKONE      BACKUP ONE LINE
0872 DF 48          VERLI2  STX     CURPOS      SAVE POINTER
0874 DF 4A                  STX     NEWPOS
0876 39                     RTS                 RETURN

                    * PRINT ROUTINE

0877 8D 2F          PRINT   BSR     TSTEMP
0879 DE 44                  LDX     BUFPNT      SET POINTER
087B BD 04 E9               JSR     FINDT       FIND TARGET
087E DE 4A          PRINTO  LDX     NEWPOS      SET POINTER
0880 7C 00 8A               INC     PRNFLG      SET FLAG
0883 DF 48                  STX     CURPOS      SAVE IT
0885 9C 93          PRINT1  CPX     TRGLIN      TARGET LINE?
0887 26 03                  BNE     PRIN12
```

```
LOCN B1 B2 B3
0889 7F 00 8A          CLR     PRNFLG    CLEAR FLAG
088C 8D 21      PRIN12 BSR     OUTLIN
088E 96 8A             LDA A   PRNFLG    CHECK FLAG
0890 27 0B             BEQ     PRINT5
0892 96 8C             LDA A   DRCTN     CHECK DIRECTION
0894 27 EF             BEQ     PRINT1
0896 09                DEX               DEC POINTER TWICE
0897 09                DEX
0898 BD 07 F0          JSR     BAKONE    MOVE BACK ONE
089B 20 E8             BRA     PRINT1
089D BD 07 F0  PRINT5  JSR     BAKONE    MOVE BACK ONE
08A0 DF 48             STX     CURPOS    SAVE POINTER
08A2 BD 09 B5  PRINT6  JSR     TSTMSL
08A5 7E 03 8A          JMP     EDIT      RETURN

               * TEST IF FILE EMPTY

08A8 DE 97     TSTEMP  LDX     FILBEG
08AA 9C 99             CPX     FILEND
08AC 27 F4             BEQ     PRINT6
08AE 39                RTS

               * OUTPUT ONE LINE

08AF BD 04 4E  OUTLIN  JSR     PCRLF
08B2 96 6A             LDA A   NUMFLG
08B4 26 06             BNE     OUTL15
08B6 8D 15             BSR     OUTSPC    OUTPUT SPACE
08B8 08                INX               BUMP THE POINTER
08B9 08                INX
08BA 20 03             BRA     OUTLI2
08BC 8D 16     OUTL15  BSR     OUTBCD    OUTPUT LINE NO.
08BE 09                DEX
08BF 08        OUTLI2  INX
08C0 A6 00             LDA A   0,X       GET A CHAR.
08C2 81 0D             CMP A   #CRGRET   IS IT C.R.?
08C4 27 05             BEQ     OUTLI4
08C6 BD 02 09          JSR     OUTCH     OUTPUT IT
08C9 20 F4             BRA     OUTLI2    REPEAT
08CB 08        OUTLI4  INX               BUMP THE POINTER
08CC 39                RTS               RETURN

               * OUTPUT A SPACE

08CD 86 20     OUTSPC  LDA A   #'        LOAD UP SPACE
08CF BD 02 09          JSR     OUTCH     OUTPUT IT
08D2 0C                CLC
08D3 39                RTS               RETURN

               * OUTPUT A BCD NUMBER
```

```
LOCN B1 B2 B3
08D4 96 6A      OUTBCD  LDA A  NUMFLG    CHECK FLAG
08D6 27 2E              BEQ    OUTB75
08D8 8D F3              BSR    OUTSPC    OUTPUT A SPACE
08DA C6 02              LDA B  #2        SET COUNTER
08DC 0C                 CLC
08DD A6 00      OUTBC2  LDA A  0,X       GET CHAR.
08DF 85 F0              BIT A  #$F0      MASK
08E1 25 02              BCS    OUTBC3
08E3 27 06              BEQ    OUTB35
08E5 BD 09 13   OUTBC3  JSR    OUTHL     OUTPUT DIGIT
08E8 0D                 SEC              SET FLAG
08E9 20 02              BRA    OUTBC4
08EB 8D E0      OUTB35  BSR    OUTSPC
08ED A6 00      OUTBC4  LDA A  0,X       GET DIGIT
08EF C5 FE              BIT B  #$FE      CHECK IF DONE
08F1 27 06              BEQ    OUTBC6
08F3 85 0F              BIT A  #$0F      MASK
08F5 25 02              BCS    OUTBC6
08F7 27 05              BEQ    OUTB65
08F9 8D 1C      OUTBC6  BSR    OUTHR     OUTPUT DIGIT
08FB 0D                 SEC
08FC 20 02              BRA    OUTBC7
08FE 8D CD      OUTB65  BSR    OUTSPC
0900 08         OUTBC7  INX              BUMP THE POINTER
0901 5A                 DEC B            DEC THE COUNTER
0902 27 07              BEQ    OUTBC8
0904 2A D7              BPL    OUTBC2
0906 86 3D      OUTB75  LDA A  #'=
0908 7E 02 09   OUTB78  JMP    OUTCH     OUTPUT A "="
090B 86 2E      OUTBC8  LDA A  #'.       OUTPUT A "."
090D BD 02 09           JSR    OUTCH
0910 0D                 SEC
0911 20 CA              BRA    OUTBC2    GO FINISH

                * OUTPUT DIGITS ROUTINE

0913 44         OUTHL   LSR A            SHIFT LEFT FOUR TIMES
0914 44                 LSR A
0915 44                 LSR A
0916 44                 LSR A
0917 84 0F      OUTHR   AND A  #$0F      MASK
0919 8B 30              ADD A  #$30      MAKE ASCII
091B 20 EB              BRA    OUTB78

                * SET NUMBERS ON OR OFF

091D 8D 18      NUMSET  BSR    ONOFF     GET ON OFF
091F 27 07              BEQ    NUMSE2
0921 2B 0A              BMI    NUMSE4
0923 7F 00 6A           CLR    NUMFLG    CLEAR FLAG
0926 20 08              BRA    NUMSE6
0928 43         NUMSE2  COM A           COM. FLAG
0929 97 6A              STA A  NUMFLG    SAVE IN FLAG
```

```
LOCN B1 B2 B3
092B 20 03              BRA     NUMSE6
092D 73 00 6A  NUMSE4   COM     NUMFLG      COM FLAG
0930 DE 4A     NUMSE6   LDX     NEWPOS
0932 DF 48              STX     CURPOS      SET POINTER
0934 7E 08 A2           JMP     PRINT6


                * CHECK FOR ON OR OFF

0937 DE 44     ONOFF    LDX     BUFFNT      SET POINTER
0939 BD 04 92           JSR     SKIPSP      SKIP SPACES
093C DF 44              STX     BUFFNT      SAVE POINTER
093E DF 40              STX     TEMP
0940 CE 09 46           LDX     #ONOFTB     POINT TO TABLE
0943 7E 04 00           JMP     EDIT6


                * TABLE FOR ON OFF

0946 4F        ONOFTB   FCC     'ON'
0947 4E
0948 00                 FCB     0
0949 09 56              FDB     ON
094B 4F                 FCC     'OFF'
094C 46
094D 46
094E 00                 FCB     0
094F 09 58              FDB     OFF
0951 0D                 FCB     CRGRET
0952 00                 FCB     0
0953 09 5B              FDB     TOGGLE
0955 00                 FCB     0


                * ON OFF ROUTINES

0956 4F        ON       CLR A
0957 39                 RTS                 RETURN
0958 86 01     OFF      LDA A   #1          SET FLAG
095A 39                 RTS                 RETURN
095B DE 44     TOGGLE   LDX     BUFFNT
095D 09                 DEX
095E DF 44              STX     BUFFNT      FIX
0960 86 FF              LDA A   #$FF        SET FLAG
0962 39                 RTS                 RETURN


                * SET VERIFY FLAG

0963 8D D2     VERSET   BSR     ONOFF       CHECK ON OFF
0965 27 07              BEQ     VERSE2
0967 2B 0A              BMI     VERSE4
0969 7F 00 6B           CLR     VERFLG      CLEAR FLAG
096C 20 08              BRA     VERSE6
096E 43        VERSE2   COM A
```

```
LOCN B1 B2 B3
096F 97 6B              STA A  VERFLG
0971 20 03              BRA    VERSE6
0973 73 00 6B  VERSE4   COM    VERFLG     COM. FLAG
0976 20 B8     VERSE6   BRA    NUMSE6


               * CURSOR CONTROL COMMAND 'X'

0978 8D 2A     XCNTRL   BSR    TFORCR
097A CE 09 82           LDX    #CNRSTR    POINT TO STRING
097D BD 04 85           JSR    PDATA1     OUTPUT IT
0980 20 AE              BRA    NUMSE6

0982 00        CNRSTR   FCB    0,0,0,0,0,0
0983 00
0984 00
0985 00
0986 00
0987 00
0988 04                 FCB    4          THIS 4 MUST REMAIN !!


               * EXIT ROUTINE

0989 8D 19     EXIT     BSR    TFORCR
098B 7E E0 D0           JMP    MIKBUG     EXIT


               * SET POINTER TO BOTTOM

098E 8D 14     BOTTOM   BSR    TFORCR
0990 BD 08 A8  BOTTO1   JSR    TSTEMP
0993 DE 99              LDX    FILEND
0995 BD 07 F0           JSR    BAKONE     MOVE BACK ONE
0998 DF 48     BOTTO2   STX    CURPOS     SAVE-POINTER
099A 7E 08 A2           JMP    PRINT6


               * SET POINTER TO TOP

099D 8D 05     TOP      BSR    TFORCR
099F BD 08 A8           JSR    TSTEMP
09A2 20 F4              BRA    BOTTO2


               * TEST OR C.R.

09A4 DE 44     TFORCR   LDX    BUFPNT     SET POINTER
09A6 BD 04 92           JSR    SKIPSP
09A9 81 0D              CMP A  #CRGRET    IS IT C.R.?
09AB 27 04              BEQ    TFORC2
09AD 91 B5              CMP A  EOL
09AF 26 01              BNE    TFORC3
09B1 39        TFORC2   RTS                RETURN
09B2 7E 04 71  TFORC3   JMP    SYNERR
```

```
LOCN B1 B2 B3

                    * TEST FOR MULTIPLE STATEMENTS PER LINE

09B5 DE 44      TSTMSL  LDX     BUFPNT      GET POINTER
09B7 86 0D              LDA A   #CRGRET     GET C.R.
09B9 D6 B5              LDA B   EOL         GET EOL CHAR.
09BB A1 00      TSTMS2  CMP A   0,X         CHECK CHARACTER
09BD 27 0C              BEQ     TSTMS5
09BF E1 00              CMP B   0,X
09C1 27 03              BEQ     TSTMS4
09C3 08                 INX                 BUMP POINTER ONE
09C4 20 F5              BRA     TSTMS2      REPEAT
09C6 08         TSTMS4  INX
09C7 DF 44              STX     BUFPNT      SAVE BUFFER POINT
09C9 97 6C              STA A   MSLFLG      SET FLAG
09CB 39         TSTMS5  RTS                 RETURN

                    * PROCCESS THE NEXT COMMAND

09CC 7C 00 76   NEXT    INC     NXTFLG

                    * FIND COMMAND

09CF BD 08 A8   CFIND   JSR     TSTEMP
09D2 7C 00 75           INC     LINFLG      SET FLAG
09D5 8D 71              BSR     OCCURR      CHECK FOR OCCURRENCE
09D7 DE 93              LDX     TRGLIN      SET POINTER
09D9 BD 08 21           JSR     TSTOVR      CHECK LIMITS
09DC 27 2A              BEQ     CFIND2
09DE D6 76              LDA B   NXTFLG      CHECK FLAG
09E0 26 43              BNE     CFIND5
09E2 20 04              BRA     CFIN12
09E4 96 77      CFIND1  LDA A   ALLFLG      CHECK IF ALL
09E6 26 40              BNE     CFIND6
09E8 CE 0A 31   CFIN12  LDX     #CFNTST     POINT TO STRING
09EB BD 04 83           JSR     PSTRNG      OUTPUT IT
09EE DE 5E              LDX     ZONE1       CHECK ZONES
09F0 8C 00 01           CPX     #$0001
09F3 26 07              BNE     CFIN13
09F5 DE 60              LDX     ZONE2       CHECK ZONE 2
09F7 8C 01 36           CPX     #$0136
09FA 27 06              BEQ     CFIN14
09FC CE 0A 3B   CFIN13  LDX     #ZOKSTR     POINT TO STRING
09FF BD 04 85           JSR     PDATA1      OUTPUT IT
0A02 7F 00 6C   CFIN14  CLR     MSLFLG
0A05 7E 03 8A   CFIN15  JMP     EDIT        RETURN
0A08 DE 93      CFIND2  LDX     TRGLIN      POINT TO TARGET
0A0A 9C 4A              CPX     NEWPOS      SAME ONE?
0A0C 27 1A              BEQ     CFIND6
0A0E DF 4A              STX     NEWPOS      SAVE IT
0A10 D6 78      CFIND3  LDA B   OCRFLG      CHECK FLAG
0A12 27 11              BEQ     CFIND5
```

```
LOCN B1 B2 B3
0A14 D6 76              LDA B  NXTFLG    CHECK FLAG
0A16 26 03              BNE    CFIND4
0A18 BD 08 3F           JSR    VERLIN    VERIFY LINE
0A1B BD 0A 83  CFIND4   JSR    NXTOCR    CHECK NEXT OCCUR.
0A1E BD 08 21           JSR    TSTOVR    CHECK LIMITS
0A21 27 E5              BEQ    CFIND2
0A23 20 06              BRA    CFIND9
0A25 BD 08 3F  CFIND5   JSR    VERLIN    VERIFY LINE
0A28 7E 08 A2  CFIND6   JMP    PRINT6
0A2B D6 76     CFIND9   LDA B  NXTFLG    CHECK FLAG
0A2D 26 F6              BNE    CFIND5
0A2F 20 B3              BRA    CFIND1


0A31 4E        CFNTST   FCC    'NOT FOUND'
0A32 4F
0A33 54
0A34 20
0A35 46
0A36 4F
0A37 55
0A38 4E
0A39 44
0A3A 04                 FCB    4

0A3B 2E        ZOKSTR   FCC    '...ZONES OK?'
0A3C 2E
0A3D 2E
0A3E 5A
0A3F 4F
0A40 4E
0A41 45
0A42 53
0A43 20
0A44 4F
0A45 4B
0A46 3F
0A47 04                 FCB    4


               * CHECK FOR OCCURRENCE

0A48 DE 44     OCCURR   LDX    BUFPNT    SET POINTER
0A4A DF 46              STX    BUFSAV    SAVE IT
0A4C 7F 00 77           CLR    ALLFLG
0A4F 7F 00 78           CLR    OCRFLG
0A52 BD 04 E9           JSR    FINDT     FIND TARGET
0A55 DE 44              LDX    BUFPNT    RESTORE POINTER
0A57 BD 07 38           JSR    SKPCLS
0A5A C1 01              CMP B  #1        IS IT NUMBER?
0A5C 27 09              BEQ    OCCUR3
0A5E 81 2A              CMP A  #'*       IS IT A "*"?
0A60 26 17              BNE    OCCUR5
0A62 7C 00 77           INC    ALLFLG    SET FOR ALL OCCUR.
0A65 20 0F              BRA    OCCUR4
```

```
LOCN B1 B2 B3
0A67 BD 07 55  OCCUR3  JSR     BCDCON     GET NUMBER
0A6A BD 08 38          JSR     TSTNUM     ZERO?
0A6D 27 0A             BEQ     OCCUR5
0A6F BD 08 2A          JSR     DECNUM     DEC NUMBER
0A72 27 05             BEQ     OCCUR5
0A74 8D 04             BSR     SAVOCR     SAVE OCCURRENCE
0A76 7C 00 78  OCCUR4  INC     OCRFLG     SET FLAG
0A79 39        OCCUR5  RTS                RETURN

               * SAVE PRESENT OCCURRENCE COUNT

0A7A 96 90     SAVOCR  LDA A   NUMBER     GET NUMBER
0A7C 97 6E             STA A   OCRCNT     SAVE IT
0A7E 96 91             LDA A   NUMBER+1
0A80 97 6F             STA A   OCRCNT+1
0A82 39                RTS                RETURN

               * PROCCESS NEXT OCCURRENCE

0A83 96 77     NXTOCR  LDA A   ALLFLG     CHECK FOR ALL
0A85 26 0F             BNE     NXTOC1
0A87 96 6E     NXTOC0  LDA A   OCRCNT     GET COUNT
0A89 97 90             STA A   NUMBER     PUT IN NUMBER
0A8B 96 6F             LDA A   OCRCNT+1
0A8D 97 91             STA A   NUMBER+1
0A8F BD 08 2A          JSR     DECNUM     DEC THE COUNT
0A92 27 0B             BEQ     NXTOC2
0A94 8D E4             BSR     SAVOCR     SAVE COUNT
0A96 96 85     NXTOC1  LDA A   CHGFLG
0A98 26 0A             BNE     NXTOC3
0A9A DE 46             LDX     BUFSAV     RESTORE POINTER
0A9C 7E 04 E9          JMP     FINDT      FIND TARGET AND RET
0A9F 7F 00 78  NXTOC2  CLR     OCRFLG     CLEAR FLAG
0AA2 20 F2             BRA     NXTOC1
0AA4 39        NXTOC3  RTS                RETURN

               * EQUALS COMMAND

0AA5 BD 08 A8  EQUALS  JSR     TSTEMP
0AA8 DE 44             LDX     BUFPNT     SET POINTER
0AAA 7F 00 7D          CLR     BMPFLG
0AAD 7C 00 84          INC     SNGLIN
0AB0 7C 00 7E          INC     EQUFLG
0AB3 96 74             LDA A   NOCURL     CURRENT LINE?
0AB5 26 20             BNE     INSER1
0AB7 DE 4A             LDX     NEWPOS
0AB9 DF 93             STX     TRGLIN     FIX TARGET
0ABB BD 06 98          JSR     GETNUM     GET NUMBER
0ABE 7C 00 81          INC     REPFLG     SET FLAG
0AC1 96 8E             LDA A   CHRCNT+1
0AC3 97 82             STA A   TMPCHR
0AC5 7E 0C BB          JMP     DELETO
```

```
LOCN B1 B2 B3

                    * INSERT ROUTINE

0AC8 DE 44      INSERT  LDX     BUFPNT      SET POINTER
0ACA 7F 00 7D           CLR     BMPFLG      CLEAR FLAG
0ACD A6 00              LDA A   0,X         GET CHAR.
0ACF 81 0D              CMP A   #CRGRET
0AD1 27 17              BEQ     INSER4
0AD3 7C 00 84           INC     SNGLIN      SET FLAG
0AD6 08                 INX                 BUMP THE POINTER
0AD7 DF 44      INSER1  STX     BUFPNT      SAVE IT
0AD9 CE 00 BB           LDX     #BUFFER
0ADC 96 8E              LDA A   CHRCNT+1      GET COUNT
0ADE 9C 44      INSER2  CPX     BUFPNT      CHECK POINT
0AE0 27 04              BEQ     INSER3
0AE2 4A                 DEC A               DEC THE COUNTER
0AE3 08                 INX                 BUMP THE POINTER
0AE4 20 F8              BRA     INSER2
0AE6 8B 03      INSER3  ADD A   #3          FIX COUNT
0AE8 97 8E              STA A   CHRCNT+1
0AEA DE 4A      INSER4  LDX     NEWPOS      SET POINTER
0AEC DF 48              STX     CURPOS      SAVE POINTER
0AEE 96 7E              LDA A   EQUFLG
0AF0 27 06              BEQ     INSE42
0AF2 96 72              LDA A   OVRBEG      CHECK LIMIT
0AF4 27 14              BEQ     INSE43
0AF6 20 25              BRA     INSER5
0AF8 BD 06 98   INSE42  JSR     GETNUM
0AFB 96 7F              LDA A   INLMFL      CHECK FLAG
0AFD 27 0B              BEQ     INSE43
0AFF 9C 99              CPX     FILEND      EMPTY?
0B01 27 07              BEQ     INSE43
0B03 5F                 CLR B               CLEAR ACC.
0B04 D7 90              STA B   NUMBER      SAVE IN NUMBER
0B06 D7 91              STA B   NUMBER+1
0B08 20 13              BRA     INSER5
0B0A BD 08 0F   INSE43  JSR     UPONE       UP ONE LINE
0B0D E6 02              LDA B   2,X         GET DIGIT
0B0F 96 73              LDA A   OVREND      LIMIT?
0B11 27 0A              BEQ     INSER5
0B13 5F         INSE45  CLR B
0B14 DE 99              LDX     FILEND
0B16 9C 97              CPX     FILBEG
0B18 26 03              BNE     INSER5
0B1A BD 07 A3           JSR     CLRNUM      CLEAR OUT NUMBER

                    * CALCULATE LINE NUMBER INCREMENT

0B1D DF 58      INSER5  STX     SPCPT1      SAVE POINTER
0B1F 96 7E              LDA A   EQUFLG
0B21 26 2C              BNE     INSE60
0B23 96 73              LDA A   OVREND      LIMIT?
0B25 27 05              BEQ     INSE51
0B27 7F 00 92           CLR     NUMBER+2
```

```
LOCN B1 B2 B3
0B2A 20 1C              BRA     INSER6
0B2C 96 7D      INSE51  LDA A   BMPFLG
0B2E 26 18              BNE     INSER6
0B30 96 92              LDA A   NUMBER+2  GET NUMBER
0B32 D7 82              STA B   TMPCHR
0B34 9A 82              ORA A   TMPCHR
0B36 27 0D              BEQ     INSE55
0B38 96 7F              LDA A   INLMFL    CHECK FLAG
0B3A 27 03              BEQ     INSE52
0B3C 7F 00 92           CLR     NUMBER+2
0B3F 86 01      INSE52  LDA A   #1
0B41 97 7C              STA A   INCAMT    SET AMOUNT
0B43 20 03              BRA     INSER6
0B45 7A 00 7C   INSE55  DEC     INCAMT
0B48 BD 06 6A   INSER6  JSR     BMPNUM    BUMP NUMBER
0B4B 96 84              LDA A   SNGLIN    CHECK IF SINGLE IN
0B4D 27 04              BEQ     INSE61

                * ENTER BUFFERED INPUT MODE

0B4F DE 44      INSE60  LDX     BUFPNT
0B51 20 2D              BRA     INSE71
0B53 7F 00 7F   INSE61  CLR     INLMFL
0B56 BD 04 4E           JSR     PCRLF
0B59 CE 00 90           LDX     #NUMBER   POINT TO NUMBER
0B5C BD 08 D4           JSR     OUTBCD    OUTPUT IT
0B5F 7F 00 8D           CLR     CHRCNT
0B62 86 03              LDA A   #3        SET COUNTER
0B64 97 8E              STA A   CHRCNT+1
0B66 97 7D              STA A   BMPFLG    SET FLAG
0B68 CE 00 BB           LDX     #BUFFER   SET POINTER
0B6B BD 04 99   INSE62  JSR     INCHAR    GET A CHARACTER
0B6E 27 E3              BEQ     INSE61
0B70 81 0D              CMP A   #CRGRET   IS IT C.R.?
0B72 27 07              BEQ     INSER7
0B74 A7 00              STA A   0,X
0B76 BD 04 BB           JSR     BUFLIM    CHECK LIMIT
0B79 20 F0              BRA     INSE62    REPEAT
0B7B A7 00      INSER7  STA A   0,X
0B7D CE 00 BB           LDX     #BUFFER   SET POINTER
0B80 DF 44      INSE71  STX     BUFPNT    SAVE IT
0B82 A6 00              LDA A   0,X       GET CHAR.
0B84 91 B4              CMP A   LINO      ESCAPE?
0B86 26 40              BNE     INSE72
0B88 96 8E              LDA A   CHRCNT+1
0B8A 80 03              SUB A   #3        FIX COUNT
0B8C 97 8E              STA A   CHRCNT+1
0B8E 08                 INX               BUMP THE POINTER

                * CHECK IF RENUMBERING NECESSARY

0B8F DF 40      INS710  STX     TEMP      SAVE POINTER
0B91 DE 4A              LDX     NEWPOS
0B93 BD 08 0F           JSR     UPONE     UP ONE LINE
0B96 7D 00 73           TST     OVREND    LIMIT?
```

```
LOCN B1 B2 B3
0B99 26 1A            BNE     INS711
0B9B 7C 00 83         INC     CHKFLG      SET FLAG
0B9E D6 90            LDA B   NUMBER      GET NUMBER
0BA0 96 91            LDA A   NUMBER+1
0BA2 BD 07 BA         JSR     FNDNU4      CHECK NUMBER
0BA5 26 0E            BNE     INS711
0BA7 4F               CLR A
0BA8 97 7C            STA A   INCAMT      SET INC AMOUNT
0BAA 97 92            STA A   NUMBER+2
0BAC BD 06 B0         JSR     RENUM2      RENUMBER FILE
0BAF CE 0B F2         LDX     #RENSTR     POINT TO STRING
0BB2 BD 04 83         JSR     PSTRNG      OUTPUT IT
0BB5 DE 40      INS711 LDX    TEMP        RESTORE POINTER
0BB7 7D 00 84         TST     SNGLIN
0BBA 27 06            BEQ     INS712
0BBC DE 4A            LDX     NEWPOS      FIX POINTER
0BBE DF 48            STX     CURPOS
0BC0 20 03            BRA     INS713
0BC2 7C 00 6C  INS712 INC     MSLFLG      SET FLAG
0BC5 7E 03 8A  INS713 JMP     EDIT

               * ACTUAL LINE INSERT

0BC8 8D 3E      INSE72 BSR    MAKSPC      MAKE SOME SPACE
0BCA DE 40             LDX    TEMP        RESTORE POINTER
0BCC DF 4A             STX    NEWPOS
0BCE BD 06 8B          JSR    PUTNUM      PUT NUMBER
0BD1 08                INX                BUMP 3 TIMES
0BD2 08                INX
0BD3 08                INX
0BD4 DF 40             STX    TEMP        SAVE POINTER
0BD6 DE 44      INSE75 LDX    BUFPNT
0BD8 A6 00             LDA A  0,X         GET CHAR.
0BDA 08                INX                BUMP THE POINTER
0BDB DF 44             STX    BUFPNT      SAVE IT
0BDD DE 40             LDX    TEMP
0BDF A7 00             STA A  0,X         PUT CHAR.
0BE1 08                INX                BUMP
0BE2 DF 40             STX    TEMP        SAVE
0BE4 81 0D             CMP A  #CRGRET
0BE6 26 EE             BNE    INSE75      REPEAT
0BE8 BD 12 85          JSR    EXPLIN      EXPAND TABS
0BEB 96 84             LDA A  SNGLIN
0BED 26 A0             BNE    INS710
0BEF 7E 0A EA          JMP    INSER4


0BF2 53        RENSTR  FCC    'SOME LINES RENUMBERED'
0BF3 4F
0BF4 4D
0BF5 45
0BF6 20
0BF7 4C
0BF8 49
0BF9 4E
```

```
LOCN B1 B2 B3
0BFA 45
0BFB 53
0BFC 20
0BFD 52
0BFE 45
0BFF 4E
0C00 55
0C01 4D
0C02 42
0C03 45
0C04 52
0C05 45
0C06 44
0C07 04                 FCB     4


                * MAKE ROOM FOR INSERT

0C08 7F 00 89  MAKSPC   CLR     DECCNT      CLEAR COUNT
0C0B DE 58             LDX     SPCPT1      SET POINTER
0C0D DF 40             STX     TEMP        SAVE
0C0F 9C 99             CPX     FILEND      END OF FILE?
0C11 26 03             BNE     MAKSP1
0C13 7C 00 89          INC     DECCNT
0C16 DE 99     MAKSP1  LDX     FILEND      SET POINTER
0C18 DF 58             STX     SPCPT1      SAVE
0C1A D6 8D             LDA B   CHRCNT
0C1C 96 8E             LDA A   CHRCNT+1
0C1E 26 03             BNE     MAKS21
0C20 5D        MAKS18  TST B
0C21 27 37     MAKSP2  BEQ     MAKSP4
0C23 BC 02 12  MAKS21  CPX     MEMEND      END OF MEMORY?
0C26 27 26             BEQ     MAKSP3
0C28 08                INX                 BUMP THE POINTER
0C29 7D 00 8C          TST     DRCTN       WHICH DIRECTION?
0C2C 26 04             BNE     MAKS22
0C2E DF 42             STX     XSAVE       SAVE POINTER
0C30 20 0C             BRA     MAK222
0C32 7D 00 8B  MAKS22  TST     CPYDRC
0C35 27 0E             BEQ     MAKS23
0C37 DF 42             STX     XSAVE       SAVE THE POINTER
0C39 DE 4A             LDX     NEWPOS      GET POSITION
0C3B 08                INX                 BUMP IT
0C3C DF 4A             STX     NEWPOS      SAVE IT
0C3E DE 93     MAK222  LDX     TRGLIN      GET TARGET
0C40 08                INX                 BUMP IT
0C41 DF 93             STX     TRGLIN
0C43 DE 42             LDX     XSAVE       RESTORE POINTER
0C45 4D        MAKS23  TST A               TEST THE ACC.
0C46 26 01             BNE     MAKS24
0C48 5A                DEC B               DEC THE COUNTER
0C49 4A        MAKS24  DEC A
0C4A 26 D7             BNE     MAKS21
0C4C 20 D2             BRA     MAKS18      REPEAT
0C4E CE 0C 77  MAKSP3  LDX     #NORMST     POINT TO STRING
```

```
LOCN B1 B2 B3
0C51 BD 04 83           JSR     PSTRNG      OUTPUT IT
0C54 7F 00 6C           CLR     MSLFLG
0C57 7E 03 8A           JMP     EDIT        RETURN
0C5A DF 99      MAKSP4  STX     FILEND      SAVE POINTER
0C5C DF 5A              STX     SPCPT2      SAVE POINTER
0C5E 96 89              LDA A   DECCNT      CHECK
0C60 26 14              BNE     MAKSP6
0C62 DF 5A      MAKSP5  STX     SPCPT2      SAVE POINTER
0C64 DE 58      MAKS55  LDX     SPCPT1
0C66 9C 40              CPX     TEMP        DONE?
0C68 27 0C              BEQ     MAKSP6
0C6A 09                 DEX                 DEC THE POINTER
0C6B A6 00              LDA A   0,X         GET CHAR.
0C6D DF 58              STX     SPCPT1      SAVE POINTER
0C6F DE 5A              LDX     SPCPT2
0C71 09                 DEX                 DEC THE POINTER
0C72 A7 00              STA A   0,X         PUT THE CHAR.
0C74 20 EC              BRA     MAKSP5      REPEAT
0C76 39         MAKSP6  RTS                 RETURN


0C77 4E         NORMST  FCC     'NOT ENOUGH ROOM'
0C78 4F
0C79 54
0C7A 20
0C7B 45
0C7C 4E
0C7D 4F
0C7E 55
0C7F 47
0C80 48
0C81 20
0C82 52
0C83 4F
0C84 4F
0C85 4D
0C86 04                 FCB     4


                * REPLACE LINES ROUTINE

0C87 7C 00 81   REPLAC  INC     REPFLG      SET FLAG


                * DELETE LINES ROUTINE

0C8A DE 44      DELETE  LDX     BUFPNT      SET POINTER
0C8C BD 04 E9           JSR     FINDT       FIND TARGET
0C8F BD 08 21           JSR     TSTOVR      LIMITS?
0C92 27 27              BEQ     DELETO
0C94 CE 0D 7F   DELE02  LDX     #NTRCHS     POINT TO STRING
0C97 BD 04 83           JSR     PSTRNG      OUTPUT IT
0C9A CE 00 BB           LDX     #BUFFER     POINT TO BUFFER
0C9D BD 04 99   DELE04  JSR     INCHAR      GET A CHARACTER
0CA0 27 F2              BEQ     DELE02
```

```
LOCN B1 B2 B3
0CA2 A7 00          STA A  0,X       SAVE IT
0CA4 08             INX
0CA5 81 0D          CMP A  #CRGRET   C.R.?
0CA7 26 F4          BNE    DELE04    REPEAT
0CA9 CE 00 BB       LDX    #BUFFER
0CAC BD 04 92       JSR    SKIPSP    SKIP SPACES
0CAF 81 59          CMP A  #'Y       WAS IT 'Y'ES?
0CB1 27 08          BEQ    DELETO
0CB3 CE 0D A3       LDX    #NLDSTR   POINT TO STRING
0CB6 BD 04 83       JSR    PSTRNG
0CB9 20 60          BRA    DELET5    RETURN
0CBB DE 4A    DELETO LDX    NEWPOS    SET POINTER
0CBD 96 8C          LDA A  DRCTN     CHECK DIRECTION
0CBF 27 15          BEQ    DELET1
0CC1 BD 08 0F       JSR    UPONE     MOVE UP ONE
0CC4 96 73          LDA A  OVREND    LIMIT?
0CC6 27 02          BEQ    DELE15
0CC8 DE 99          LDX    FILEND
0CCA DF 5A    DELE15 STX    SPCPT2
0CCC DE 93          LDX    TRGLIN    GET TARGET
0CCE DF 48          STX    CURPOS    MAKE CURRENT
0CD0 DF 58          STX    SPCPT1
0CD2 DE 5A          LDX    SPCPT2    GET POINTER
0CD4 20 11          BRA    DELE25
0CD6 DF 58    DELET1 STX    SPCPT1    SAVE
0CD8 DF 48          STX    CURPOS
0CDA DE 93          LDX    TRGLIN    POINT TO TARGET
0CDC BD 08 0F       JSR    UPONE     MOVE UP ONE
0CDF 96 73          LDA A  OVREND    LIMIT?
0CE1 27 02          BEQ    DELET2
0CE3 DE 99          LDX    FILEND    POINT TO END
0CE5 DF 5A    DELET2 STX    SPCPT2    SAVE POINTER
0CE7 4F       DELE25 CLR A
0CE8 5F              CLR B
0CE9 9C 58    DELET3 CPX    SPCPT1
0CEB 27 07          BEQ    DELET4
0CED 4C             INC A
0CEE 26 01          BNE    DELE35
0CF0 5C             INC B             BUMP THE COUNTER
0CF1 09       DELE35 DEX
0CF2 20 F5          BRA    DELET3
0CF4 97 8E    DELET4 STA A  CHRCNT+1   SAVE COUNT
0CF6 D7 8D          STA B  CHRCNT
0CF8 8D 49          BSR    DELCHR    DELETE CHARACTERS
0CFA 96 81          LDA A  REPFLG    REPLACE?
0CFC 27 1D          BEQ    DELET5
0CFE DE 48          LDX    CURPOS    SET POINTER
0D00 BD 07 F0       JSR    BAKONE    BACKUP ONE LINE
0D03 96 7E          LDA A  EQUFLG
0D05 26 2C          BNE    DELET7
0D07 96 72          LDA A  OVRBEG    CHECK LIMIT
0D09 27 08          BEQ    DELE45
0D0B BD 07 A3       JSR    CLRNUM    CLEAR NUMBER
0D0E DF 4A          STX    NEWPOS    SAVE NEW POSITION
0D10 7E 0B 1D       JMP    INSER5
```

```
LOCN B1 B2 B3
0D13 DF 4A      DELE45  STX     NEWPOS      SAVE
0D15 7F 00 7D           CLR     BMPFLG
0D18 7E 0A EA           JMP     INSER4      GO TO INSERT
0D1B DE 48      DELET5  LDX     CURPOS      CHECK POSITION
0D1D 9C 99              CPX     FILEND      END?
0D1F 26 0D              BNE     DELET6
0D21 BD 07 F0           JSR     BAKONE      MOVE IT BACK
0D24 DF 40              STX     TEMP        SAVE POINTER
0D26 CE 0D B4           LDX     #BFRSTR     POINT TO STRING
0D29 BD 04 83           JSR     PSTRNG      OUTPUT IT
0D2C DE 40              LDX     TEMP        RESTORE
0D2E DF 48      DELET6  STX     CURPOS
0D30 7E 08 A2           JMP     PRINT6
0D33 DF 4A      DELET7  STX     NEWPOS      SAVE POINTER
0D35 96 82              LDA A   TMPCHR      GET CHAR COUNT
0D37 97 8E              STA A   CHRCNT+1
0D39 4F                 CLR A
0D3A 97 7D              STA A   BMPFLG      CLEAR FLAG
0D3C 97 8D              STA A   CHRCNT
0D3E DE 44              LDX     BUFPNT      SET POINTER
0D40 7E 0A D7           JMP     INSER1      GO INSERT IT

                * DELETE CHARACTER BLOCK

0D43 DE 5A      DELCHR  LDX     SPCPT2      SET POINTER
0D45 9C 58              CPX     SPCPT1      EQUAL?
0D47 27 35              BEQ     DELCH5
0D49 9C 99              CPX     FILEND      END OF FILE?
0D4B 27 0E              BEQ     DELCH2
0D4D A6 00              LDA A   0,X         GET A CHAR.
0D4F 08                 INX                 BUMP THE POINTER
0D50 DF 5A              STX     SPCPT2      SAVE
0D52 DE 58              LDX     SPCPT1
0D54 A7 00              STA A   0,X         PUT CHAR.
0D56 08                 INX
0D57 DF 58              STX     SPCPT1      SAVE POINTER
0D59 20 E8              BRA     DELCHR      REPEAT
0D5B D6 8D      DELCH2  LDA B   CHRCNT      GET COUNT
0D5D 96 8E              LDA A   CHRCNT+1
0D5F 26 03              BNE     DELC31
0D61 5D         DELC21  TST B               CHECK COUNT
0D62 27 18      DELCH3  BEQ     DELCH4
0D64 09         DELC31  DEX                 DEC THE POINTER
0D65 7D 00 8C           TST     DRCTN       WHICH DIRECTION?
0D68 26 09              BNE     DELC32
0D6A DF 42              STX     XSAVE
0D6C DE 93              LDX     TRGLIN      GET TARGET
0D6E 09                 DEX                 DEC IT
0D6F DF 93              STX     TRGLIN      PUT IT BACK
0D71 DE 42              LDX     XSAVE       RESTORE POINTER
0D73 4D         DELC32  TST A               TEST COUNT
0D74 26 01              BNE     DELC34
0D76 5A                 DEC B               DEC THE COUNTER
0D77 4A         DELC34  DEC A
```

```
LOCN B1 B2 B3
0D78 26 EA              BNE     DELC31
0D7A 20 E5              BRA     DELC21
0D7C DF 99      DELCH4  STX     FILEND      SET NEW END
0D7E 39         DELCH5  RTS                 RETURN

0D7F 54         NTRCHS  FCC     'TARGET NOT REACHED!'
0D80 41
0D81 52
0D82 47
0D83 45
0D84 54
0D85 20
0D86 4E
0D87 4F
0D88 54
0D89 20
0D8A 52
0D8B 45
0D8C 41
0D8D 43
0D8E 48
0D8F 45
0D90 44
0D91 21
0D92 0D                 FCB     $D,$A,0,0,0,0
0D93 0A
0D94 00
0D95 00
0D96 00
0D97 00
0D98 59                 FCC     'YOU SURE? '
0D99 4F
0D9A 55
0D9B 20
0D9C 53
0D9D 55
0D9E 52
0D9F 45
0DA0 3F
0DA1 20
0DA2 04                 FCB     4

0DA3 4E         NLDSTR  FCC     'NO LINES DELETED'
0DA4 4F
0DA5 20
0DA6 4C
0DA7 49
0DA8 4E
0DA9 45
0DAA 53
0DAB 20
0DAC 44
0DAD 45
0DAE 4C
```

```
LOCN B1 B2 B3
0DAF 45
0DB0 54
0DB1 45
0DB2 44
0DB3 04                 FCB     4

0DB4 42         BFRSTR  FCC     'BOTTOM OF FILE REACHED'
0DB5 4F
0DB6 54
0DB7 54
0DB8 4F
0DB9 4D
0DBA 20
0DBB 4F
0DBC 46
0DBD 20
0DBE 46
0DBF 49
0DC0 4C
0DC1 45
0DC2 20
0DC3 52
0DC4 45
0DC5 41
0DC6 43
0DC7 48
0DC8 45
0DC9 44
0DCA 04                 FCB     4


                * CHANGE COMMAND ROUTINE

0DCB BD 08 A8   CHANGE  JSR     TSTEMP
0DCE DE 44              LDX     BUFPNT      POINT TO BUFFER
0DD0 BD 07 38           JSR     SKPCLS
0DD3 BD 06 63           JSR     TSTEND
0DD6 27 03              BEQ     CHAN12      ERROR
0DD8 5D         CHANG1  TST B
0DD9 27 03              BEQ     CHAN15      ERROR
0DDB 7E 0F 04   CHAN12  JMP     CHANG9
0DDE 7C 00 85   CHAN15  INC     CHGFLG      SET FLAG
0DE1 BD 05 FA           JSR     SETDEL      SET DELIMITERS
0DE4 5F                 CLR B               CLEAR COUNT
0DE5 A6 00      CHANG2  LDA A   0,X         GET CHAR.
0DE7 BD 06 63           JSR     TSTEND
0DEA 27 08              BEQ     CHANG3
0DEC 91 95              CMP A   DELIM       IS IT DELIMITER?
0DEE 27 04              BEQ     CHANG3
0DF0 08                 INX                 BUMP THE POINTER
0DF1 5C                 INC B               BUMP THE COUNT
0DF2 20 F1              BRA     CHANG2
0DF4 DF 66      CHANG3  STX     CHGEND      SAVE POINTER
0DF6 D7 86              STA B   STRCN2      SAVE COUNT
0DF8 BD 06 63           JSR     TSTEND
```

```
LOCN B1 B2 B3
0DFB 27 01              BEQ     CHAN35
0DFD 08                 INX                     BUMP POINTER
0DFE DF 44      CHAN35  STX     BUFPNT          SAVE IT
0E00 DE 4A              LDX     NEWPOS
0E02 08         CHAN37  INX                     BUMP THREE TIMES
0E03 08                 INX
0E04 08                 INX
0E05 DF 64              STX     CHGPNT          SAVE POINTER
0E07 BD 0F 07           JSR     SVSTPT          SAVE STRING POINT
0E0A 7F 00 85           CLR     CHGFLG
0E0D BD 0A 48           JSR     OCCURR          GET TARG & OCCUR.
0E10 7C 00 85           INC     CHGFLG
0E13 BD 0F 14           JSR     RSTSPT          RESTORE STRING
0E16 7F 00 6D           CLR     PSTZFL
0E19 DE 6E              LDX     OCRCNT          GET COUNT
0E1B DF 68              STX     OCRTMP          SAVE
0E1D 96 78              LDA A   OCRFLG
0E1F 27 07              BEQ     CHANG4
0E21 96 7B              LDA A   STRCNT          CHECK COUNT
0E23 26 03              BNE     CHANG4
0E25 7E 0F 04           JMP     CHANG9
0E28 DE 4A      CHANG4  LDX     NEWPOS
0E2A 9C 93              CPX     TRGLIN          AT TARGET?
0E2C 26 03              BNE     CHANG5
0E2E 7C 00 88           INC     LSTFLG          SET FLAG IF SO
0E31 BD 06 3B   CHANG5  JSR     ZONE3           SET ZONE
0E34 7F 00 79           CLR     CHGONF          CLEAR FLAG
0E37 DE 64              LDX     CHGPNT
0E39 BD 06 5A           JSR     FIXZON          SET ZONE
0E3C BD 05 B8           JSR     FIND72
0E3F 20 10              BRA     CHA510

                * LOOP THROUGH OCCURRENCES

0E41 7F 00 79   CHAN50  CLR     CHGONF
0E44 DE 64      CHAN51  LDX     CHGPNT          SET POINTER
0E46 BD 06 5A           JSR     FIXZON
0E49 BD 06 4F           JSR     CMPZN2          CHECK ZONE
0E4C 22 7A              BHI     CHANG8
0E4E BD 05 DF           JSR     FIND75
0E51 96 90      CHA510  LDA A   NUMBER          GET NUMBER
0E53 97 62              STA A   ZONBUF          PUT IN BUFFER
0E55 96 91              LDA A   NUMBER+1
0E57 97 63              STA A   ZONBUF+1
0E59 5D                 TST B
0E5A 26 6C              BNE     CHANG8
0E5C 5C                 INC B                   BUMP COUNTER
0E5D D7 87              STA B   FNONFL          SET FLAG
0E5F 96 78      CHAN52  LDA A   OCRFLG          ANY OCCURR.?
0E61 27 0E              BEQ     CHANG6
0E63 96 77              LDA A   ALLFLG          CHANGE ALL?
0E65 26 0A              BNE     CHANG6
0E67 BD 0A 87           JSR     NXTOCO
0E6A DE 5C      CHAN55  LDX     LASTNO          SET POINTER
0E6C 08                 INX                     BUMP IT
```

```
LOCN B1 B2 B3
0E6D DF 64              STX     CHGPNT
0E6F 20 D0              BRA     CHAN50

                * DELETE STRING ONE

0E71 7C 00 79  CHANG6   INC     CHGONF      SET FLAG
0E74 DE 68              LDX     OCRTMP      CHECK COUNT
0E76 27 04              BEQ     CHAN61
0E78 86 01              LDA A   #1
0E7A 97 78              STA A   OCRFLG
0E7C DF 6E      CHAN61  STX     OCRCNT      FIX COUNT
0E7E DE 5C              LDX     LASTNO      GET STR. LOCATION
0E80 DF 58              STX     SPCPT1
0E82 D6 7B              LDA B   STRCNT
0E84 27 10              BEQ     CHAN66
0E86 7F 00 8D           CLR     CHRCNT      CLEAR COUNT
0E89 D7 8E              STA B   CHRCNT+1
0E8B 27 04      CHAN62  BEQ     CHAN65
0E8D 08                 INX                 BUMP POINTER
0E8E 5A                 DEC B               DEC THE COUNTER
0E8F 20 FA              BRA     CHAN62      REPEAT
0E91 DF 5A      CHAN65  STX     SPCPT2      SAVE POINTER
0E93 BD 0D 43           JSR     DELCHR      GO DELETE

                * INSERT STRING TWO

0E96 D6 86      CHAN66  LDA B   STRCN2      GET COUNT
0E98 27 23              BEQ     CHA675
0E9A 7F 00 8D           CLR     CHRCNT      CLEAR OUT COUNT
0E9D D7 8E              STA B   CHRCNT+1    SET COUNTER
0E9F DE 5C              LDX     LASTNO      SET POINTER
0EA1 DF 58              STX     SPCPT1
0EA3 BD 0C 08           JSR     MAKSPC      GO MAKE ROOM
0EA6 D6 8E              LDA B   CHRCNT+1
0EA8 DE 50              LDX     STRNGE      POINT TO STRING END
0EAA 08         CHAN67  INX                 BUMP IT
0EAB A6 00              LDA A   0,X         GET CHAR
0EAD DF 40              STX     TEMP
0EAF DE 5C              LDX     LASTNO
0EB1 A7 00              STA A   0,X         PUT CHARACTER
0EB3 08                 INX                 BUMP POINTER
0EB4 DF 5C              STX     LASTNO      SAVE
0EB6 DF 64              STX     CHGPNT
0EB8 DE 40              LDX     TEMP        RESTORE
0EBA 5A                 DEC B               DEC THE COUNTER
0EBB 26 ED              BNE     CHAN67
0EBD 96 77      CHA675  LDA A   ALLFLG      DO ALL?
0EBF 27 1C              BEQ     CHAN81
0EC1 DE 5C              LDX     LASTNO
0EC3 DF 64              STX     CHGPNT      SAVE POINTER
0EC5 7E 0E 44           JMP     CHAN51      REPEAT

                * CHANGE CLEANUP AND FINISH

0EC8 7F 00 78  CHANG8   CLR     OCRFLG      CLEAR FLAG
```

```
LOCN B1 B2 B3
0ECB DE 68              LDX     OCRTMP    GET COUNT
0ECD 27 04              BEQ     CHAN80
0ECF 86 01              LDA A   #1        SET FLAG
0ED1 97 78              STA A   OCRFLG
0ED3 DF 6E      CHAN80  STX     OCRCNT    SET OCCUR. COUNT
0ED5 96 87              LDA A   FNONFL    CHECK FLAG
0ED7 26 04              BNE     CHAN81
0ED9 96 88              LDA A   LSTFLG
0EDB 26 27              BNE     CHANG9
0EDD DE 4A      CHAN81  LDX     NEWPOS
0EDF 96 79              LDA A   CHGONF
0EE1 27 03              BEQ     CHAN82
0EE3 BD 08 3F           JSR     VERLIN    VERIFY CHANGE
0EE6 96 88      CHAN82  LDA A   LSTFLG
0EE8 27 06              BEQ     CHAN84
0EEA 7F 00 79           CLR     CHGONF    CLEAR FLAG
0EED 7E 08 A2           JMP     PRINT6
0EF0 BD 06 C3   CHAN84  JSR     NXTLIN    FIND NEXT LINE
0EF3 DF 4A              STX     NEWPOS    SAVE POINTER
0EF5 9C 93              CPX     TRGLIN    TARGET LINE?
0EF7 26 03              BNE     CHAN86
0EF9 7C 00 88           INC     LSTFLG    SET LAST FLAG
0EFC 08         CHAN86  INX               BUMP 3 TIMES
0EFD 08                 INX
0EFE 08                 INX
0EFF DF 64              STX     CHGPNT    SAVE POINTER
0F01 7E 0E 31           JMP     CHANG5    REPEAT
0F04 7E 04 41   CHANG9  JMP     ERROR     REPORT ERROR

                * SAVE STRING POINTER INFO

0F07 DE 4E      SVSTPT  LDX     STRNGB    GET POINTER
0F09 DF 52              STX     STRGB1    SAVE IT
0F0B DE 50              LDX     STRNGE
0F0D DF 54              STX     STRGE1
0F0F 96 7B              LDA A   STRCNT    GET COUNT
0F11 97 71              STA A   STRCN1    SAVE IT
0F13 39                 RTS               RETURN

                * RESTORE STRING POINTER INFO

0F14 DE 52      RSTSPT  LDX     STRGB1    GET POINTER
0F16 DF 4E              STX     STRNGB    RESTORE
0F18 DE 54              LDX     STRGE1
0F1A DF 50              STX     STRNGE
0F1C 96 71              LDA A   STRCN1    GET COUNT
0F1E 97 7B              STA A   STRCNT    RESTORE IT
0F20 39                 RTS               RETURN

                * OVERLAY ROUTINE

0F21 BD 08 A8   OVERLA  JSR     TSTEMP
```

```
LOCN B1 B2 B3
0F24 86 20          LDA A  #$20       SETUP SPACE
0F26 97 95          STA A  DELIM      AS DELIMITER
0F28 7F 00 8C       CLR    DRCTN
0F2B DE 44          LDX    BUFPNT     SET POINTER TO BUFFER
0F2D A6 00          LDA A  0,X        GET A CHAR.
0F2F 81 0D          CMP A  #CRGRET
0F31 27 12          BEQ    OVRLA1
0F33 BD 07 3B       JSR    CLASS
0F36 5D             TST B
0F37 27 03          BEQ    OVRLA0
0F39 7E 04 71       JMP    SYNERR      REPORT ERROR
0F3C 97 95    OVRLA0 STA A  DELIM      SET DELIMITER
0F3E 08             INX
0F3F A6 00          LDA A  0,X        GET CHARACTER
0F41 81 0D          CMP A  #CRGRET
0F43 26 2C          BNE    OVRL35
0F45 DE 4A    OVRLA1 LDX    NEWPOS     SET POINTER
0F47 BD 08 AF OVRL11 JSR    OUTLIN     OUTPUT CUR. LINE
0F4A 96 6A          LDA A  NUMFLG
0F4C 26 05          BNE    OVRL12
0F4E CE 0F D2       LDX    #OVRLST+8  POINT TO STRING
0F51 20 03          BRA    OVRL16
0F53 CE 0F CA OVRL12 LDX   #OVRLST    POINT TO STRING
0F56 BD 04 83 OVRL16 JSR   PSTRNG     OUTPUT IT
0F59 CE 00 BB       LDX    #BUFFER    POINT TO IN BUFFER
0F5C BD 04 99 OVRLA2 JSR   INCHAR     GET A CHAR.
0F5F 27 E4          BEQ    OVRLA1
0F61 81 0D          CMP A  #CRGRET
0F63 27 07          BEQ    OVRLA3
0F65 A7 00          STA A  0,X
0F67 BD 04 BB       JSR    BUFLIM
0F6A 20 F0          BRA    OVRLA2
0F6C A7 00    OVRLA3 STA A  0,X
0F6E CE 00 BB       LDX    #BUFFER    POINT TO BUFFER
0F71 DF 44    OVRL35 STX    BUFPNT
0F73 C6 0D          LDA B  #CRGRET
0F75 DE 4A          LDX    NEWPOS     POINT TO POSITION
0F77 08             INX
0F78 08             INX
0F79 08             INX
0F7A DF 40          STX    TEMP       SAVE POINTER
0F7C DE 44    OVRLA4 LDX    BUFPNT
0F7E A6 00    OVRL41 LDA A  0,X        GET A CHAR.
0F80 08             INX               BUMP POINTER
0F81 DF 44          STX    BUFPNT     SAVE IT
0F83 81 0D          CMP A  #CRGRET
0F85 27 3B          BEQ    OVRLA7
0F87 DE 40          LDX    TEMP
0F89 7D 00 8C       TST    DRCTN
0F8C 26 08          BNE    OVRL43
0F8E E1 00          CMP B  0,X        CHECK IT
0F90 27 0B          BEQ    OVRLA5
0F92 91 95          CMP A  DELIM      IS IT DELIMITER?
0F94 27 02          BEQ    OVRL45
0F96 A7 00    OVRL43 STA A  0,X        PUT CHARACTER
```

```
 LOCN B1 B2 B3
 0F98 08          OVRL45  INX              BUMP POINTER
 0F99 DF 40               STX    TEMP
 0F9B 20 DF               BRA    OVRLA4
 0F9D 96 8C       OVRLA5  LDA A  DRCTN      CHECK DIRECTION
 0F9F 26 21               BNE    OVRLA7
 0FA1 4F                  CLR A
 0FA2 97 8D               STA A  CHRCNT     CLEAR COUNT
 0FA4 DE 44               LDX    BUFPNT     GET POINTER
 0FA6 4C          OVRL55  INC A
 0FA7 E1 00               CMP B  0,X        CHECK CHAR.
 0FA9 27 03               BEQ    OVRLA6
 0FAB 08                  INX              BUMP THE POINTER
 0FAC 20 F8               BRA    OVRL55     REPEAT
 0FAE 97 8E       OVRLA6  STA A  CHRCNT+1   SAVE COUNT
 0FB0 DE 40               LDX    TEMP
 0FB2 DF 58               STX    SPCPT1     SET POINTER
 0FB4 86 01               LDA A  #1
 0FB6 97 8C               STA A  DRCTN      SET DIRECTION
 0FB8 BD 0C 08            JSR    MAKSPC     MAKE ROOM
 0FBB C6 0D               LDA B  #CRGRET
 0FBD DE 44               LDX    BUFPNT     GET POINTER
 0FBF 09                  DEX
 0FC0 20 BC               BRA    OVRL41
 0FC2 DE 4A       OVRLA7  LDX    NEWPOS     GET POSITION
 0FC4 BD 08 3F            JSR    VERLIN     VERIFY LINE
 0FC7 7E 03 8A    OVRLA8  JMP    EDIT       RETURN

 0FCA 20          OVRLST  FCC    ' OVERLAY '
 0FCB 4F
 0FCC 56
 0FCD 45
 0FCE 52
 0FCF 4C
 0FD0 41
 0FD1 59
 0FD2 20
 0FD3 04                  FCB    4


                 * MOVE COMMAND

 0FD4 7C 00 80    MOVE    INC    MOVFLG     SET FLAG
 0FD7 8D 1A               BSR    COPY       GO DO COPY
 0FD9 96 8B               LDA A  CPYDRC     WHICH DIRECTION?
 0FDB 97 8C               STA A  DRCTN
 0FDD DE 93               LDX    TRGLIN     GET TARGET
 0FDF DF 5A               STX    SPCPT2
 0FE1 DE 4A               LDX    NEWPOS     GET POSITION
 0FE3 DF 58               STX    SPCPT1
 0FE5 DE 48               LDX    CURPOS     GET CURRENT POS.
 0FE7 DF 93               STX    TRGLIN     MAKE IT TARGET
 0FE9 BD 0D 43            JSR    DELCHR     DELETE LINES
 0FEC DE 93               LDX    TRGLIN
 0FEE DF 48               STX    CURPOS     FIX POSITION
 0FF0 7E 08 A2            JMP    PRINT6
```

```
LOCN B1 B2 B3

                    * COPY LINES COMMAND

0FF3 DE 44      COPY    LDX     BUFPNT      POINT TO BUFFER
0FF5 7C 00 76           INC     NXTFLG      SET FLAG
0FF8 7C 00 75           INC     LINFLG      SET FLAG
0FFB BD 04 E9           JSR     FINDT       FIND TARGET
0FFE 9C 99              CPX     FILEND
1000 27 1A              BEQ     COPY0
1002 7F 00 75           CLR     LINFLG
1005 7F 00 76           CLR     NXTFLG
1008 9C 97              CPX     FILBEG      BEGINNING?
100A 26 04              BNE     COPY02
100C 9C 4A              CPX     NEWPOS
100E 27 04              BEQ     COPY05
1010 96 8C      COPY02  LDA A   DRCTN       FIX DIRECTION
1012 97 8B              STA A   CPYDRC
1014 7F 00 8C   COPY05  CLR     DRCTN
1017 BD 08 21           JSR     TSTOVR      LIMITS?
101A 27 03              BEQ     COPY1
101C 7E 04 5F   COPY0   JMP     NOTFND      REPORT ERROR
101F BD 07 E6   COPY1   JSR     FNDCRT      FIND NEXT C.R.
1022 08                 INX                 BUMP POINTER ONE
1023 DF 58              STX     SPCPT1
1025 DE 44              LDX     BUFPNT
1027 BD 04 E9           JSR     FINDT       GO FIND TARGET
102A BD 08 21           JSR     TSTOVR      LIMITS?
102D 26 ED              BNE     COPY0
102F 7D 00 8C           TST     DRCTN       DIRECTION?
1032 26 08              BNE     COPY15
1034 DE 4A              LDX     NEWPOS      GET POINTER
1036 DF 40              STX     TEMP
1038 DE 93              LDX     TRGLIN
103A 20 06              BRA     COPY18
103C DE 93      COPY15  LDX     TRGLIN      GET TARGET
103E DF 40              STX     TEMP        SAVE IT
1040 DE 4A              LDX     NEWPOS
1042 BD 07 E6   COPY18  JSR     FNDCRT      GET NEXT C.R.
1045 08                 INX                 BUMP POINTER
1046 DF 93              STX     TRGLIN      SET TARGET
1048 DE 40              LDX     TEMP
104A DF 4A              STX     NEWPOS
104C 4F                 CLR A               CLEAR ACCUMULATORS
104D 5F                 CLR B
104E 08         COPY2   INX                 BUMP THE POINTER
104F 4C                 INC A               BUMP COUNT
1050 26 01              BNE     COPY25
1052 5C                 INC B
1053 9C 93      COPY25  CPX     TRGLIN      FINISHED?
1055 27 10              BEQ     COPY3
1057 9C 58              CPX     SPCPT1      OVERLAP?
1059 26 F3              BNE     COPY2
105B CE 10 B4           LDX     #OVLPST     POINT TO STRING
105E BD 04 83           JSR     PSTRNG      OUTPUT IT
```

```
LOCN B1 B2 B3
1061 7F 00 6C           CLR     MSLFLG
1064 7E 03 8A           JMP     EDIT        RETURN
1067 97 8E      COPY3   STA A   CHRCNT+1    SAVE COUNT
1069 D7 8D              STA B   CHRCNT
106B 86 01              LDA A   #1          SET DIRECTION
106D 97 8C              STA A   DRCTN
106F BD 0C 08           JSR     MAKSPC      MAKE ROOM FOR LINES
1072 DE 5A              LDX     SPCPT2
1074 DF 48              STX     CURPOS      SET CUR. POSITION
1076 DE 58              LDX     SPCPT1
1078 DF 42              STX     XSAVE
107A DE 93              LDX     TRGLIN      GET TARGET
107C DF 58              STX     SPCPT1
107E DE 4A              LDX     NEWPOS
1080 DF 40              STX     TEMP        SET POINTER
1082 BD 0C 64           JSR     MAKS55      MOVE LINES
1085 DE 42              LDX     XSAVE       RESTORE POINTER
1087 7F 00 72           CLR     OVRBEG
108A BD 07 F0           JSR     BAKONE      MOVE BACK ONE
108D 96 72              LDA A   OVRBEG      LIMIT?
108F 27 18              BEQ     COPY5
1091 BD 07 A3           JSR     CLRNUM      CLEAR NUMBER
1094 7C 00 83   COPY4   INC     CHKFLG      SET FLAG
1097 BD 06 B0           JSR     RENUM2      GO RENUMBER
109A DE 48              LDX     CURPOS      GET POSITION
109C BD 07 F0           JSR     BAKONE
109F DF 48              STX     CURPOS      SET CUR. POSITION
10A1 96 80              LDA A   MOVFLG      MOVE?
10A3 27 01              BEQ     COPY45
10A5 39                 RTS                 RETURN
10A6 7E 08 A2   COPY45  JMP     PRINT6
10A9 BD 06 98   COPY5   JSR     GETNUM      GET LINE NUMBER
10AC 4F                 CLR A
10AD 97 92              STA A   NUMBER+2
10AF BD 08 0F           JSR     UPONE
10B2 20 E0              BRA     COPY4

10B4 53         OVLPST  FCC     'SOURCE OVERLAPS DESTINATION'
10B5 4F
10B6 55
10B7 52
10B8 43
10B9 45
10BA 20
10BB 4F
10BC 56
10BD 45
10BE 52
10BF 4C
10C0 41
10C1 50
10C2 53
10C3 20
10C4 44
10C5 45
```

```
 LOCN B1 B2 B3
 10C6 53
 10C7 54
 10C8 49
 10C9 4E
 10CA 41
 10CB 54
 10CC 49
 10CD 4F
 10CE 4E
 10CF 04                    FCB     4


                    * TAB SET COMMAND

 10D0 CE 00 9D  TAB         LDX     #TABBUF     SET POINTER
 10D3 DF 9B                 STX     TABPNT
 10D5 DE 44     TAB2        LDX     BUFPNT      POINT TO BUFFER
 10D7 BD 04 92              JSR     SKIPSP
 10DA DF 44                 STX     BUFPNT      SAVE
 10DC BD 06 63              JSR     TSTEND
 10DF 27 2F                 BEQ     TAB6
 10E1 BD 07 3B              JSR     CLASS       CLASSIFY CHAR.
 10E4 C1 01                 CMP B   #1          IS IT A NUMBER?
 10E6 27 07                 BEQ     TAB4
 10E8 22 2E                 BHI     TAB8
 10EA 08                    INX                 BUMP THE POINTER
 10EB DF 44                 STX     BUFPNT      SAVE IT
 10ED 20 E6                 BRA     TAB2
 10EF BD 07 55  TAB4        JSR     BCDCON      GET COLUMN
 10F2 DF 44                 STX     BUFPNT
 10F4 5F                    CLR B
 10F5 BD 08 38              JSR     TSTNUM      IS IT ZERO?
 10F8 27 16                 BEQ     TAB6
 10FA 5C        TAB5        INC B               BUMP COUNT
 10FB 37                    PSH B
 10FC BD 08 2A              JSR     DECNUM      DEC THE COUNT
 10FF 33                    PUL B
 1100 26 F8                 BNE     TAB5
 1102 DE 9B                 LDX     TABPNT      POINT TO TABS
 1104 E7 00                 STA B   0,X         SAVE COUNT
 1106 08                    INX
 1107 DF 9B                 STX     TABPNT      FIX TAB POINTER
 1109 8C 00 B1              CPX     #TABEND
 110C 27 02                 BEQ     TAB6
 110E 20 C5                 BRA     TAB2
 1110 4F        TAB6        CLR A
 1111 DE 9B                 LDX     TABPNT
 1113 A7 00                 STA A   0,X         CLEAR TAB
 1115 7E 09 30              JMP     NUMSE6
 1118 7E 04 71  TAB8        JMP     SYNERR       REPORT ERROR


                    * PRINT HEADER COMMAND

111B CE 00 9D  HEADER      LDX     #TABBUF     SET POINTER
```

```
LOCN B1 B2 B3
111E DF 9B              STX     TABPNT
1120 DE 44              LDX     BUFPNT
1122 BD 04 92           JSR     SKIPSP      SKIP ALL SPACES
1125 BD 06 63           JSR     TSTEND
1128 27 1C              BEQ     HEAD42
112A BD 07 3B  HEADE2   JSR     CLASS       CLASSIFY CHAR.
112D C1 01              CMP B   #1          IS IT NUMBER?
112F 26 E7              BNE     TAB8        ERROR
1131 BD 07 55           JSR     BCDCON      GET NUMBER COUNT
1134 DF 44              STX     BUFPNT
1136 BD 08 38           JSR     TSTNUM      IS IT ZERO?
1139 27 40              BEQ     HEADE7
113B 5F                 CLR B
113C 5C        HEADE3   INC B               BUMP COUNTER
113D 37                 PSH B
113E BD 08 2A           JSR     DECNUM      DEC NUMBER
1141 33                 PUL B
1142 26 F8              BNE     HEADE3
1144 D7 96     HEADE4   STA B   HEDCNT      SAVE COUNT
1146 BD 07 A3  HEAD42   JSR     CLRNUM      CLEAR NUMBER
1149 BD 04 4E           JSR     PCRLF       OUTPUT C.R. L.F.
114C 96 6A              LDA A   NUMFLG      LINE NUMBERS ON?
114E 27 08              BEQ     HEADE5
1150 C6 08              LDA B   #8          SET COUNT
1152 BD 08 CD  HEAD45   JSR     OUTSPC      OUT SPACE
1155 5A                 DEC B
1156 26 FA              BNE     HEAD45
1158 BD 08 CD  HEADE5   JSR     OUTSPC
115B 5F                 CLR B               CLEAR COUNT
115C 37        HEAD55   PSH B
115D BD 06 7C           JSR     INCNUM      BUMP NUMBER
1160 33                 PUL B
1161 5C                 INC B               BUMP COUNT
1162 DE 9B              LDX     TABPNT      GET TAB COL.
1164 E1 00              CMP B   0,X         THERE?
1166 26 0A              BNE     HEAD57
1168 86 2D              LDA A   #'-         SET UP '-'
116A BD 02 09           JSR     OUTCH       OUTPUT IT
116D 08                 INX                 BUMP POINTER
116E DF 9B              STX     TABPNT
1170 20 05              BRA     HEAD58
1172 96 91     HEAD57   LDA A   NUMBER+1    GET NUMBER
1174 BD 09 17           JSR     OUTHR       OUTPUT IT
1177 D1 96     HEAD58   CMP B   HEDCNT
1179 26 E1              BNE     HEAD55      REPEAT TIL DONE
117B 7E 09 30  HEADE7   JMP     NUMSE6

               * SET UP ZONE COLUMN COMMAND

117E DE 44     SZONE    LDX     BUFPNT      POINT TO BUFFER
1180 BD 04 92           JSR     SKIPSP
1183 BD 06 63           JSR     TSTEND
1186 27 0A              BEQ     SZONE2
1188 BD 07 3B           JSR     CLASS       CLASSIFY CHARACTER
```

```
LOCN B1 B2 B3
118B C1 01          CMP B  #1        IS IT A NUMBER?
118D 27 0A          BEQ    SZONE3
118F 22 38          BHI    SZONE8
1191 08             INX
1192 DF 44     SZONE2  STX    BUFPNT    SAVE POINTER
1194 CE 00 01          LDX    #$0001    SET COLUMN 1
1197 20 07             BRA    SZONE4
1199 BD 07 55  SZONE3  JSR    BCDCON    GET NUMBER
119C DF 44             STX    BUFPNT    SAVE POINTER
119E DE 90             LDX    NUMBER
11A0 DF 5E     SZONE4  STX    ZONE1     FIX ZONE1
11A2 DE 44             LDX    BUFPNT
11A4 BD 04 92  SZONE5  JSR    SKIPSP    SKIP ALL SPACES
11A7 BD 06 63          JSR    TSTEND
11AA 27 0C             BEQ    SZONE6
11AC BD 07 3B          JSR    CLASS     GO CLASSIFY
11AF C1 01             CMP B  #1        IS IT A NUMBER?
11B1 27 0A             BEQ    SZONE7
11B3 22 14             BHI    SZONE8    ERROR
11B5 08                INX              BUMP POINTER
11B6 20 EC             BRA    SZONE5
11B8 CE 01 36  SZONE6  LDX    #$0136    SET COLUMN 136
11BB 20 07             BRA    SZON75
11BD BD 07 55  SZONE7  JSR    BCDCON    GET NUMBER
11C0 DF 44             STX    BUFPNT    SAVE POINTER
11C2 DE 90             LDX    NUMBER
11C4 DF 60     SZON75  STX    ZONE2     SET ZONE2
11C6 7E 09 30          JMP    NUMSE6
11C9 7E 04 41  SZONE8  JMP    ERROR     REPORT ERROR

               * SET SPECIAL CHARATERS COMMAND

11CC DE 44     SET     LDX    BUFPNT    SET POINTER
11CE BD 04 92          JSR    SKIPSP
11D1 DF 44             STX    BUFPNT
11D3 DF 40             STX    TEMP      SAVE POINTER
11D5 CE 12 41          LDX    #CHRTBL   POINT TO TABLE
11D8 7E 04 00          JMP    EDIT6     GO FIND NAME

               * SET SPECIALS HERE
               * TAB
11DB CE 00 B2  STAB    LDX    #TABCH    POINT TO TAB CHAR
11DE 20 0D             BRA    SETC

               * FILL
11E0 CE 00 B3  SFILL   LDX    #FILL     POINT TO FILL
11E3 20 08             BRA    SETC

               * EOL
11E5 CE 00 B5  SEOL    LDX    #EOL      POINT TO EOL CHAR
11E8 20 03             BRA    SETC

               * LINO
11EA CE 00 B4  SLINO   LDX    #LINO     POINT TO IT
```

```
 LOCN B1 B2 B3

                    * SET THE CHARACTER

 11ED DF 40      SETC    STX     TEMP      SAVE POINTER
 11EF DE 44              LDX     BUFPNT    GO TO BUFFER
 11F1 BD 04 92           JSR     SKIPSP
 11F4 81 3D              CMP A   #'=       IS IT =
 11F6 26 3F              BNE     SETC8     ERROR
 11F8 8D 40              BSR     CHFRQU
 11FA 26 3B              BNE     SETC8     ERROR
 11FC 8D 3C              BSR     CHFRQU
 11FE 26 04              BNE     SETC2
 1200 4F                 CLR A             SET NULL CHAR.
 1201 36                 PSH A
 1202 20 0F              BRA     SETC4
 1204 BD 07 3B   SETC2   JSR     CLASS     GO CLASSIFY
 1207 5D                 TST B
 1208 26 2D              BNE     SETC8     ERROR?
 120A 81 0D              CMP A   #CRGRET
 120C 27 29              BEQ     SETC8
 120E 36                 PSH A             SAVE CHAR
 120F 8D 29              BSR     CHFRQU
 1211 26 24              BNE     SETC8     ERROR
 1213 08         SETC4   INX
 1214 DF 44              STX     BUFPNT    SAVE POSITION
 1216 BD 09 A4           JSR     TFORCR    TEST END
 1219 32                 PUL A             GET CHAR
 121A DE 40              LDX     TEMP      RESTORE POINTER
 121C 8C 00 B3           CPX     #FILL     IS IT FILL CHAR?
 121F 26 07              BNE     SETC5
 1221 4D                 TST A
 1222 26 0E              BNE     SETC6
 1224 86 20              LDA A   #' '      SETUP SPACE
 1226 20 0A              BRA     SETC6
 1228 8C 00 B4   SETC5   CPX     #LINO     IS IT LINO?
 122B 26 05              BNE     SETC6
 122D 4D                 TST A
 122E 26 02              BNE     SETC6
 1230 86 23              LDA A   #'#       SET IT
 1232 A7 00      SETC6   STA A   0,X
 1234 7E 09 30           JMP     NUMSE6    RETURN
 1237 7E 04 71   SETC8   JMP     SYNERR     REPORT ERROR


                    * CHECK FOR QUOTE

123A 08         CHFRQU  INX               BUMP POINTER
123B BD 04 92           JSR     SKIPSP    SKIP SPACES
123E 81 27              CMP A   #''
1240 39                 RTS


                    * SPECIAL CHARACTER TABLE

1241 54         CHRTBL  FCC     'TAB'
```

```
 LOCN B1 B2 B3
 1242 41
 1243 42
 1244 00                  FCB     0
 1245 11 DB               FDB     STAB
 1247 46                  FCC     'FILL'
 1248 49
 1249 4C
 124A 4C
 124B 00                  FCB     0
 124C 11 E0               FDB     SFILL
 124E 45                  FCC     'EOL'
 124F 4F
 1250 4C
 1251 00                  FCB     0
 1252 11 E5               FDB     SEOL
 1254 4C                  FCC     'LINO'
 1255 49
 1256 4E
 1257 4F
 1258 00                  FCB     0
 1259 11 EA               FDB     SLINO
 125B 00                  FCB     0

                * EXPAND TABS COMMAND

 125C BD 08 A8  EXPAND    JSR     TSTEMP
 125F DE 44               LDX     BUFPNT      GET POINTER
 1261 BD 04 E9            JSR     FINDT       FIND TARGET
 1264 DE 4A               LDX     NEWPOS      SAVE IT
 1266 86 01               LDA A   #1
 1268 97 8A               STA A   PRNFLG      SET FLAG
 126A DF 48       EXPAN1  STX     CURPOS      SET CURRENT
 126C 9C 93               CPX     TRGLIN      LAST LINE?
 126E 26 03               BNE     EXPAN2
 1270 7F 00 8A            CLR     PRNFLG      CLEAR FLAG
 1273 8D 10       EXPAN2  BSR     EXPLIN      GO DO LINE
 1275 96 8A               LDA A   PRNFLG      DONE?
 1277 27 09               BEQ     EXPAN5
 1279 DE 4A               LDX     NEWPOS      GET POINTER
 127B BD 06 C3            JSR     NXTLIN      FIND NEXT LINE
 127E DF 4A               STX     NEWPOS      SAVE
 1280 20 E8               BRA     EXPAN1
 1282 7E 08 A2  EXPAN5    JMP     PRINT6

                * EXPAND TABS IN ONE LINE

 1285 96 B2       EXPLIN  LDA A   TABCH
 1287 91 B3               CMP A   FILL        CHECK IF FILL=TAB
 1289 27 51               BEQ     EXPLI7
 128B CE 00 9D            LDX     #TABBUF     POINT TO TABS
 128E DF 9B               STX     TABPNT
 1290 E6 00               LDA B   0,X         GET COLUMN
 1292 27 48               BEQ     EXPLI7
```

```
LOCN B1 B2 B3
1294 5F                  CLR B                CLEAR COUNT
1295 D7 8D               STA B  CHRCNT
1297 DE 4A               LDX    NEWPOS        POINT TO LINE
1299 9C 99               CPX    FILEND
129B 26 03               BNE    EXPLI1
129D 7E 03 8A            JMP    EDIT
12A0 08          EXPLI1  INX                  BUMP 3 TIMES
12A1 08                  INX                  PAST LINE NO.
12A2 08                  INX
12A3 5C          EXPLI2  INC B                BUMP COUNTER
12A4 A6 00               LDA A  0,X           CHECK FOR TAB
12A6 81 0D               CMP A  #CRGRET
12A8 27 32               BEQ    EXPLI7
12AA 91 B2               CMP A  TABCH         IS IT TAB?
12AC 27 03               BEQ    EXPLI3
12AE 08                  INX                  BUMP THE POINTER
12AF 20 F2               BRA    EXPLI2
12B1 DF 40       EXPLI3  STX    TEMP          SAVE POSITION
12B3 DE 9B               LDX    TABPNT
12B5 E1 00       EXPL35  CMP B  0,X           CHECK COLUMN
12B7 24 1E               BCC    EXPLI6
12B9 86 FF               LDA A  #$FF          SET COUNT
12BB 4C          EXPLI4  INC A
12BC 5C                  INC B
12BD E1 00               CMP B  0,X           TAB COL. YET?
12BF 26 FA               BNE    EXPLI4
12C1 97 8E               STA A  CHRCNT+1      SAVE COUNT
12C3 DE 40               LDX    TEMP
12C5 DF 58               STX    SPCPT1        SET SPACE POINTER
12C7 BD 0C 08            JSR    MAKSPC        GO MAKE ROOM
12CA D6 8E               LDA B  CHRCNT+1
12CC 5C                  INC B
12CD 96 B3               LDA A  FILL          GET FILL CHARACTER
12CF A7 00       EXPLI5  STA A  0,X           PUT CHARACTER
12D1 08                  INX
12D2 5A                  DEC B                DEC COUNT
12D3 26 FA               BNE    EXPLI5
12D5 20 AE               BRA    EXPLIN        REPEAT
12D7 08          EXPLI6  INX                  BUMP POINTER
12D8 A6 00               LDA A  0,X
12DA 26 D9               BNE    EXPL35
12DC 39          EXPLI7  RTS                  RETURN


                 * APPEND COMMAND

12DD BD 08 A8    APPEND  JSR    TSTEMP
12E0 DE 44               LDX    BUFPNT        GET POINTER
12E2 BD 04 92            JSR    SKIPSP
12E5 BD 06 63            JSR    TSTEND        ALL?
12E8 26 03               BNE    APPEN1
12EA 7E 04 71    APPEN0  JMP    SYNERR
12ED BD 07 3B    APPEN1  JSR    CLASS         GO CLASSIFY
12F0 5D                  TST B
12F1 26 F7               BNE    APPEN0
```

```
LOCN B1 B2 B3
12F3 BD 05 FA          JSR    SETDEL    SET DELIMITERS
12F6 BD 07 3B          JSR    CLASS     CLASSIFY CHARACTER
12F9 C1 01             CMP B  #1        IS IT NUMBER?
12FB 26 13             BNE    APPEN3
12FD BD 07 55          JSR    BCDCON    GET COLUMN NO.
1300 BD 08 38          JSR    TSTNUM    IS IT ZERO?
1303 27 0B             BEQ    APPEN3
1305 4F                CLR A
1306 4C          APPEN2 INCA              BUMP COUNTER
1307 36                PSH A
1308 BD 08 2A          JSR    DECNUM    DEC NUMBER
130B 32                PUL A             RESTORE COUNT
130C 26 F8             BNE    APPEN2
130E 97 7A             STA A  APPCOL    SAVE COUNT
1310 BD 0F 07  APPEN3  JSR    SVSTPT    SAVE DEL INFO
1313 DE 44             LDX    BUFPNT    GET POINTER
1315 BD 04 E9          JSR    FINDT     FIND TARGET
1318 BD 0F 14          JSR    RSTSPT    RESTORE DEL INFO
131B 7F 00 8D          CLR    CHRCNT
131E 7C 00 8A          INC    PRNFLG    SET FLAG
1321 DE 4A             LDX    NEWPOS    SET POINTER
1323 9C 93     APPE35  CPX    TRGLIN    AT TARGET?
1325 26 03             BNE    APPEN4
1327 7F 00 8A          CLR    PRNFLG    CLEAR FLAG
132A 08        APPEN4  INX              BUMP 3 TIMES
132B 08                INX
132C 08                INX
132D 96 7A             LDA A  APPCOL    GET COL. NUMBER
132F 26 06             BNE    APPEN5
1331 09                DEX
1332 BD 07 E6          JSR    FNDCRT    GET TO C.R.
1335 20 37             BRA    APPEN7
1337 16        APPEN5  TAB
1338 5A        APPE53  DEC B            DEC COUNT
1339 27 1C             BEQ    APPE65
133B A6 00             LDA A  0,X       CHECK CHARACTER
133D 81 0D             CMP A  #CRGRET
133F 27 03             BEQ    APPEN6
1341 08                INX               BUMP POINTER
1342 20 F4             BRA    APPE53
1344 DF 58     APPEN6  STX    SPCPT1    SET POSITION
1346 D7 8E             STA B  CHRCNT+1
1348 37                PSH B
1349 BD 0C 08          JSR    MAKSPC    GO MAKE MORE ROOM
134C 33                PUL B
134D 86 20             LDA A  #'        SET UP SPACE
134F A7 00     APPE63  STA A  0,X        PUT IT
1351 08                INX               BUMP POINTER
1352 5A                DEC B             DEC THE COUNT
1353 26 FA             BNE    APPE63
1355 20 17             BRA    APPEN7
1357 DF 58     APPE65  STX    SPCPT1    SET POSITION
1359 DF 40             STX    TEMP
135B A6 00     APPE66  LDA A  0,X       GET CHAR.
135D 81 0D             CMP A  #CRGRET   IS IT C.R.?
```

```
 LOCN B1 B2 B3
 135F 27 04              BEQ     APPE67
 1361 08                 INX
 1362 5C                 INC B
 1363 20 F6              BRA     APPE66
 1365 D7 8E      APPE67  STA B   CHRCNT+1
 1367 DF 5A              STX     SPCPT2
 1369 BD 0D 43           JSR     DELCHR      DELETE REST OF LINE
 136C DE 40              LDX     TEMP        GET POINTER
 136E DF 58      APPEN7  STX     SPCPT1
 1370 96 7B              LDA A   STRCNT      GET COUNT
 1372 27 12              BEQ     APPE78
 1374 97 8E      APPE72  STA A   CHRCNT+1
 1376 BD 0C 08           JSR     MAKSPC      GO MAKE ROOM
 1379 DE 50              LDX     STRNGE      POINT TO STRING
 137B DF 58              STX     SPCPT1
 137D DE 4E              LDX     STRNGB
 137F DF 40              STX     TEMP        SET END
 1381 BD 0C 64           JSR     MAKS55      PUT IN STRING
 1384 DE 5A              LDX     SPCPT2      GET POINTER
 1386 5F         APPE78  CLR B
 1387 BD 07 F6           JSR     BAKON2
 138A BD 08 3F           JSR     VERLIN
 138D 96 8A              LDA A   PRNFLG      DONE?
 138F 27 07              BEQ     APPEN8
 1391 BD 06 C3           JSR     NXTLIN      FIND NEXT LINE
 1394 DF 4A              STX     NEWPOS
 1396 20 8B              BRA     APPE35      REPEAT
 1398 DF 48      APPEN8  STX     CURPOS
 139A 7E 08 A2   APPEN9  JMP     PRINT6

                 * SAVE CURRENT FILE ON TAPE

 139D BD 09 A4   SAVE    JSR     TFORCR
 13A0 DE 97              LDX     FILBEG      SET POINTER
 13A2 DF 58              STX     SPCPT1
 13A4 DE 99              LDX     FILEND
 13A6 DF 5A              STX     SPCPT2      SET END
 13A8 8D 29              BSR     RECORD      GO RECORD IT
 13AA 7E 09 30   SAVE4   JMP     NUMSE6

                 * WRITE PART OF FILE TO TAPE

 13AD BD 08 A8   WRITE   JSR     TSTEMP
 13B0 DE 44              LDX     BUFPNT      SET POINTER
 13B2 BD 04 E9           JSR     FINDT       FIND TARGET
 13B5 96 8C              LDA A   DRCTN       CHECK DIRECTION
 13B7 26 0C              BNE     WRITE2
 13B9 BD 07 E6           JSR     FNDCRT
 13BC 08                 INX
 13BD DF 5A              STX     SPCPT2      SET POINTER
 13BF DE 4A              LDX     NEWPOS
 13C1 DF 58              STX     SPCPT1      SET BEGINNING
 13C3 20 0A              BRA     WRITE4
```

```
LOCN B1 B2 B3
13C5 DF 58      WRITE2  STX     SPCPT1
13C7 DE 4A              LDX     NEWPOS
13C9 BD 07 E6           JSR     FNDCRT
13CC 08                 INX
13CD DF 5A              STX     SPCPT2      SET END
13CF 8D 02      WRITE4  BSR     RECORD      GO RECORD IT
13D1 20 D7      WRITE5  BRA     SAVE4


                * RECORD RECORD

13D3 96 B9      RECORD  LDA A   RONCH
13D5 BD 02 0F           JSR     TOUCH
13D8 8D 2B              BSR     TDELAY      GO DELAY
13DA DE 58              LDX     SPCPT1      SET POINTER
13DC 9C 5A      RECOR2  CPX     SPCPT2      DONE?
13DE 27 15              BEQ     RECOR4
13E0 08                 INX                 GET PAST NUMBERS
13E1 08                 INX
13E2 08                 INX
13E3 A6 00      RECO25  LDA A   0,X         GET A CHARACTER
13E5 81 0D              CMP A   #CRGRET
13E7 27 06              BEQ     RECOR3
13E9 BD 02 0F           JSR     TOUCH       OUTPUT IT
13EC 08                 INX                 BUMP THE POINTER
13ED 20 F4              BRA     RECO25
13EF BD 02 0F   RECOR3  JSR     TOUCH       OUTPUT IT
13F2 08                 INX
13F3 20 E7              BRA     RECOR2
13F5 86 1A      RECOR4  LDA A   #$1A         SET CONTROL Z
13F7 BD 02 0F           JSR     TOUCH       OUTPUT IT
13FA CE FF FF   RECOR5  LDX     #$FFFF      SET COUNT
13FD 09         RECOR6  DEX
13FE 26 FD              BNE     RECOR6
1400 96 BA      RECOR7  LDA A   ROFCH
1402 BD 02 0F           JSR     TOUCH


                * DELAY FOR TAPE

1405 96 B6      TDELAY  LDA A   DELAY       GET FACTOR
1407 27 09      DELAY1  BEQ     DELAY4
1409 CE FF FF           LDX     #$FFFF      SET COUNT
140C 09         DELAY2  DEX                 DEC COUNT
140D 26 FD              BNE     DELAY2
140F 4A                 DEC A               DONE?
1410 20 F5              BRA     DELAY1
1412 39         DELAY4  RTS                 RETURN



                * PUT A GAP ON TAPE (40 NULLS)

1413 BD 09 A4   GAP     JSR     TFORCR
```

```
LOCN B1 B2 B3
1416 96 B9            LDA A  RONCH     TURN ON TAPE
1418 BD 02 0F         JSR    TOUCH
141B 8D E8            BSR    TDELAY    GO DELAY
141D C6 28            LDA B  #40       SETUP COUNT
141F 4F       GAP2    CLR A            SET NULL
1420 BD 02 0F         JSR    TOUCH     OUTPUT IT
1423 5A               DEC B            DEC COUNT
1424 26 F9            BNE    GAP2
1426 8D D8            BSR    RECOR7
1428 20 A7            BRA    WRITE5


                * READ TAPE ROUTINE

142A BD 09 A4 READ    JSR    TFORCR
142D 96 B7            LDA A  TONCH
142F BD 02 0F         JSR    TOUCH
1432 8D D1            BSR    TDELAY    GO DELAY
1434 BD 07 A3         JSR    CLRNUM
1437 DE 99            LDX    FILEND    GET END
1439 DF 40            STX    TEMP
143B 9C 97            CPX    FILBEG    EMPTY?
143D 27 08            BEQ    READ1
143F BD 07 F0         JSR    BAKONE    MOVE BACK ONE
1442 BD 06 98         JSR    GETNUM    GET NUMBER
1445 DE 99            LDX    FILEND    POINT TO END
1447 8D 35    READ1   BSR    RDCHKE
1449 8D 33            BSR    RDCHKE
144B 8D 31            BSR    RDCHKE
144D BD 02 0C READ2   JSR    TINCH     GET CHAR FROM TAPE
1450 81 0D            CMP A  #CRGRET
1452 27 0C            BEQ    READ3
1454 81 1A            CMP A  #$1A      IS IS CNTRL Z?
1456 27 0C            BEQ    READ4
1458 81 1F            CMP A  #$1F
145A 23 F1            BLS    READ2
145C 8D 21            BSR    RDCHK2
145E 20 ED            BRA    READ2
1460 8D 1D    READ3   BSR    RDCHK2
1462 20 E3            BRA    READ1     REPEAT
1464 5F       READ4   CLR B
1465 BD 07 F6         JSR    BAKON2    FIND LAST C.R.
1468 DF 99    READ5   STX    FILEND    SET NEW END
146A 7C 00 83         INC    CHKFLG
146D 96 B8            LDA A  TOFCH
146F BD 02 0F         JSR    TOUCH
1472 9C 40            CPX    TEMP
1474 27 05            BEQ    READ6
1476 DE 40            LDX    TEMP
1478 BD 06 B0         JSR    RENUM2    GO NUMBER NEW LINES
147B 7E 09 90 READ6   JMP    BOTTO1


                * READ AND CHECK END
```

```
LOCN B1 B2 B3
147E 4F          RDCHKE  CLR A             CLEAR BYTE
147F BC 02 12    RDCHK2  CPX     MEMEND     END OF MEMORY?
1482 27 04               BEQ     RDCHK3
1484 A7 00               STA A   0,X        PUT CHAR
1486 08                  INX                BUMP THE POINTER
1487 39                  RTS                RETURN
1488 BD 02 0C    RDCHK3  JSR     TINCH      GET CHAR FROM TAPE
148B 81 1A               CMP A   #$1A       IS IT TERM?
148D 26 F9               BNE     RDCHK3
148F 20 D3               BRA     READ4

1491 0D                  FCB     $0D        SET END !!

      1492       BEGPNT  EQU     *

                         ORG     $A048

A048 02 00               FDB     START

                         END
```

SYMBOL TABLE:

```
ALLFLG 0077   APPCOL 007A   APPEND 12DD   APPEN0 12EA   APPEN1 12ED
APPEN2 1306   APPEN3 1310   APPEN4 132A   APPEN5 1337   APPEN6 1344
APPEN7 136E   APPEN8 1398   APPEN9 139A   APPE35 1323   APPE53 1338
APPE63 134F   APPE65 1357   APPE66 135B   APPE67 1365   APPE72 1374
APPE78 1386   BACKSP 0008   BAKONE 07F0   BAKON2 07F6   BAKON4 0807
BAKON5 0808   BAKON6 080B   BCDCON 0755   BCDC01 0757   BCDC02 0764
BCDC04 0769   BCDC05 0778   BCDC06 077C   BCDC07 078B   BCDC08 079A
BCDC15 0761   BCDC65 0787   BCDC67 0789   BEGPNT 1492   BELL   0007
BFRSTR 0DB4   BMPFLG 007D   BMPNUM 066A   BMPNU4 0674   BOTTOM 098E
BOTTO1 0990   BOTTO2 0998   BUFFER 00BB   BUFLIM 04BB   BUFPNT 0044
BUFSAV 0046   CFIND  09CF   CFIND1 09E4   CFIND2 0A08   CFIND3 0A10
CFIND4 0A1B   CFIND5 0A25   CFIND6 0A28   CFIND9 0A2B   CFIN12 09E8
CFIN13 09FC   CFIN14 0A02   CFIN15 0A05   CFNTST 0A31   CHANGE 0DCB
CHANG1 0DD8   CHANG2 0DE5   CHANG3 0DF4   CHANG4 0E28   CHANG5 0E31
CHANG6 0E71   CHANG8 0EC8   CHANG9 0F04   CHAN12 0DDB   CHAN15 0DDE
CHAN35 0DFE   CHAN37 0E02   CHAN50 0E41   CHAN51 0E44   CHAN52 0E5F
CHAN55 0E6A   CHAN61 0E7C   CHAN62 0E8B   CHAN65 0E91   CHAN66 0E96
CHAN67 0EAA   CHAN80 0ED3   CHAN81 0EDD   CHAN82 0EE6   CHAN84 0EF0
CHAN86 0EFC   CHA510 0E51   CHA675 0EBD   CHFRQU 123A   CHGEND 0066
CHGFLG 0085   CHGONF 0079   CHGPNT 0064   CHKFLG 0083   CHRCNT 008D
CHRTBL 1241   CLASS  073B   CLASS2 074A   CLASS4 0754   CLRNUM 07A3
CMPZN1 0644   CMPZN2 064F   CMPZ14 064E   CMPZ24 0659   CNRSTR 0982
COPY   0FF3   COPY0  101C   COPY02 1010   COPY05 1014   COPY1  101F
COPY15 103C   COPY18 1042   COPY2  104E   COPY25 1053   COPY3  1067
COPY4  1094   COPY45 10A6   COPY5  10A9   CPYDRC 008B   CRGRET 000D
CRLFST 0458   CURPOS 0048   DECCNT 0089   DECNUM 082A   DELAY  00B6
```

DELAY1	1407	DELAY2	140C	DELAY4	1412	DELCHR	0D43	DELCH2	0D5B
DELCH3	0D62	DELCH4	0D7C	DELCH5	0D7E	DELCOD	0018	DELC21	0D61
DELC31	0D64	DELC32	0D73	DELC34	0D77	DELETE	0C8A	DELET0	0CBB
DELET1	0CD6	DELET2	0CE5	DELET3	0CE9	DELET4	0CF4	DELET5	0D1B
DELET6	0D2E	DELET7	0D33	DELE02	0C94	DELE04	0C9D	DELE15	0CCA
DELE25	0CE7	DELE35	0CF1	DELE45	0D13	DELIM	0095	DRCTN	008C
EDIT	038A	EDIT1	0397	EDIT2	03AB	EDIT3	03BC	EDIT4	03C1
EDIT5	03CC	EDIT55	03D1	EDIT56	03F1	EDIT58	03FB	EDIT6	0400
EDIT65	040D	EDIT7	0416	EDIT8	0429	EDIT85	0435	EDIT88	043F
EOL	00B5	EQUALS	0AA5	EQUFLG	007E	ERROR	0441	ERRSTR	044C
EXIT	0989	EXPAND	125C	EXPAN1	126A	EXPAN2	1273	EXPAN5	1282
EXPLIN	1285	EXPLI1	12A0	EXPLI2	12A3	EXPLI3	12B1	EXPLI4	12BB
EXPLI5	12CF	EXPLI6	12D7	EXPLI7	12DC	EXPL35	12B5	FILBEG	0097
FILEND	0099	FILL	00B3	FIND	04FD	FINDL	04D2	FINDL0	04E2
FINDL1	04E4	FINDL2	04E5	FINDT	04E9	FINDT0	04EE	FINDT1	04F8
FINDT2	04FB	FIND1	050A	FIND14	0521	FIND16	0526	FIND2	0532
FIND3	0541	FIND4	054D	FIND5	055A	FIND6	0565	FIND62	057A
FIND63	0584	FIND65	058C	FIND66	0594	FIND67	05A8	FIND7	05A9
FIND71	05B2	FIND72	05B8	FIND73	05C6	FIND74	05D0	FIND75	05DF
FIND77	05F4	FIND78	05F5	FIN702	05AB	FIN711	05B5	FIXZON	065A
FNDCRT	07E6	FNDCR2	07E9	FNDFLG	0070	FNDNUM	07AB	FNDNU1	07B1
FNDNU2	07B8	FNDNU4	07BA	FNDNU5	07DA	FNDN45	07D8	FNONFL	0087
GAP	1413	GAP2	141F	GETNUM	0698	HEADER	111B	HEADE2	112A
HEADE3	113C	HEADE4	1144	HEADE5	1158	HEADE7	117B	HEAD42	1146
HEAD45	1152	HEAD55	115C	HEAD57	1172	HEAD58	1177	HEDCNT	0096
INCAMT	007C	INCH	0206	INCHAR	0499	INCHR1	049C	INCHR3	04AB
INCHR4	04BA	INCH35	04B7	INCNUM	067C	INITLZ	0355	INLMFL	007F
INSERT	0AC8	INSER1	0AD7	INSER2	0ADE	INSER3	0AE6	INSER4	0AEA
INSER5	0B1D	INSER6	0B48	INSER7	0B7B	INSE42	0AF8	INSE43	0B0A
INSE45	0B13	INSE51	0B2C	INSE52	0B3F	INSE55	0B45	INSE60	0B4F
INSE61	0B53	INSE62	0B6B	INSE71	0B80	INSE72	0BC8	INSE75	0BD6
INS710	0B8F	INS711	0BB5	INS712	0BC2	INS713	0BC5	INZFLG	008F
LASTNO	005C	LINFLG	0075	LINO	00B4	LSTFLG	0088	MAKSPC	0C08
MAKSP1	0C16	MAKSP2	0C21	MAKSP3	0C4E	MAKSP4	0C5A	MAKSP5	0C62
MAKSP6	0C76	MAKS18	0C20	MAKS21	0C23	MAKS22	0C32	MAKS23	0C45
MAKS24	0C49	MAKS55	0C64	MAK222	0C3E	MEMEND	0212	MIKBUG	E0D0
MOVE	0FD4	MOVFLG	0080	MSLFLG	006C	NEWPOS	004A	NEXT	09CC
NLDSTR	0DA3	NOCURL	0074	NOFSTR	0464	NORMST	0C77	NOTFND	045F
NTRCHS	0D7F	NUMBER	0090	NUMFLG	006A	NUMSET	091D	NUMSE2	0928
NUMSE4	092D	NUMSE6	0930	NWFSTR	034B	NXTFLG	0076	NXTLIN	06C3
NXTLI2	06CA	NXTOCR	0A83	NXTOC0	0A87	NXTOC1	0A96	NXTOC2	0A9F
NXTOC3	0AA4	OCCURR	0A48	OCCUR3	0A67	OCCUR4	0A76	OCCUR5	0A79
OCRCNT	006E	OCRFLG	0078	OCRTMP	0068	OFF	0958	ON	0956
ONOFF	0937	ONOFTB	0946	OUTBCD	08D4	OUTBC2	08DD	OUTBC3	08E5
OUTBC4	08ED	OUTBC6	08F9	OUTBC7	0900	OUTBC8	090B	OUTB35	08EB
OUTB65	08FE	OUTB75	0906	OUTB78	0908	OUTCH	0209	OUTHL	0913
OUTHR	0917	OUTLIN	08AF	OUTLI2	08BF	OUTLI4	08CB	OUTL15	08BC
OUTSPC	08CD	OVER	04C1	OVERLA	0F21	OVLPST	10B4	OVRBEG	0072
OVREND	0073	OVRLA0	0F3C	OVRLA1	0F45	OVRLA2	0F5C	OVRLA3	0F6C
OVRLA4	0F7C	OVRLA5	0F9D	OVRLA6	0FAE	OVRLA7	0FC2	OVRLA8	0FC7
OVRLST	0FCA	OVRL11	0F47	OVRL12	0F53	OVRL16	0F56	OVRL35	0F71
OVRL41	0F7E	OVRL43	0F96	OVRL45	0F98	OVRL55	0FA6	PCRLF	044E
PDATA1	0485	PEDIT	0383	PREROR	0444	PRINT	0877	PRINT0	087E
PRINT1	0885	PRINT5	089D	PRINT6	08A2	PRIN12	088C	PRNFLG	008A
PROMPT	0023	PSTRNG	0483	PSTZFL	006D	PUTNUM	068B	RDCHKE	147E
RDCHK2	147F	RDCHK3	1488	READ	142A	READ1	1447	READ2	144D
READ3	1460	READ4	1464	READ5	1468	READ6	147B	RECORD	13D3
RECOR2	13DC	RECOR3	13EF	RECOR4	13F5	RECOR5	13FA	RECOR6	13FD

RENUM2	06B0	RENUM4	06C0	REPFLG	0081	REPLAC	0C87	RESTRT	0203
ROFCH	00BA	RONCH	00B9	RSTSPT	0F14	SAVE	139D	SAVE4	13AA
SAVOCR	0A7A	SEOL	11E5	SET	11CC	SETC	11ED	SETC2	1204
SETC4	1213	SETC5	1228	SETC6	1232	SETC8	1237	SETDEL	05FA
SETDE2	0600	SETDE4	060E	SETDE5	0617	SFILL	11E0	SKIPSA	0491
SKIPSP	0492	SKIPS2	0498	SKPCLS	0738	SLINO	11EA	SNGLIN	0084
SPCPT1	0058	SPCPT2	005A	SRCHPT	004C	STAB	11DB	STACK	01FF
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STRGE1	0054	STRING	06CD	STRIN1	06DA	STRIN2	06E2	STRIN3	06E8
STRIN4	0709	STRIN5	070D	STRIN6	071C	STRIN7	0729	STRIN8	072B
STRIN9	0735	STRNGB	004E	STRNGE	0050	STRPNT	0056	SVSTPT	0F07
SYNERR	0471	SYNSTR	0476	SZONE	117E	SZONE2	1192	SZONE3	1199
SZONE4	11A0	SZONE5	11A4	SZONE6	11B8	SZONE7	11BD	SZONE8	11C9
SZON75	11C4	TAB	10D0	TABBUF	009D	TABCH	00B2	TABEND	00B1
TABLE	0214	TABPNT	009B	TAB2	10D5	TAB4	10EF	TAB5	10FA
TAB6	1110	TAB8	1118	TDELAY	1405	TEMP	0040	TFORCR	09A4
TFORC2	09B1	TFORC3	09B2	TINCH	020C	TMPCHR	0082	TOFCH	00B8
TOGGLE	095B	TONCH	00B7	TOP	099D	TOUCH	020F	TRGLIN	0093
TSTEMP	08A8	TSTEND	0663	TSTEN2	0669	TSTMSL	09B5	TSTMS2	09BB
TSTMS4	09C6	TSTMS5	09CB	TSTNUM	0838	TSTNU2	083E	TSTOVR	0821
TSTOV2	0829	UPONE	080F	UPONE1	0813	UPONE2	0819	VERFLG	006B
VERLIN	083F	VERLI1	0849	VERLI2	0872	VERL12	084C	VERL15	085C
VERSET	0963	VERSE2	096E	VERSE4	0973	VERSE6	0976	WRITE	13AD
WRITE2	13C5	WRITE4	13CF	WRITE5	13D1	XCNTRL	0978	XSAVE	0042
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ZONE3	063B								

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